IN THE MATTER OF: NATURAL GAS-FIRED, PEAK-LOAD ELECTRICAL POWER GENERATING FACILITIES (PEAKER PLANTS)
Docket No. R01-10

COMPANION REPORT TO THE ILLINOIS POLLUTION CONTROL BOARD'S INFORMATIONAL ORDER OF DECEMBER 21, 2000

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I. INTRODUCTION

On July 6, 2000, Governor George H. Ryan requested that the Illinois Pollution Control Board (Board) conduct inquiry hearings on the potential environmental impact of natural gas-fired, peak-load electrical power generating facilities, known as peaker plants. The Board opened this docket, R01-10, on July 13, 2000, and has completed its inquiry hearings.

This Report is a companion to the Informational Order that the Board issued on December 21, 2000. The Report summarizes the record on which the Board based its Informational Order. The record includes the testimony, hearing exhibits, and public comments that the Board received during the inquiry hearing proceedings.

The Board's findings and recommendations are not set forth in this Report, but rather in the Informational Order. In the Informational Order, the Board made several recommendations to tighten environmental regulations with respect to peaker plants. A summary of the Informational Order is attached to this Report as Appendix A. The Informational Order and the Report are available on the Board's Web site (www.ipcb.state.il.us) and from the Board's offices in Chicago (312-814-3620) and Springfield (217-524-8500).

This Report organizes the record information into ten broad subject matters: (1) background on peaker plants; (2) air emissions; (3) noise emissions; (4) water quality; (5) solid waste; (6) water quantity; (7) electric industry restructuring and its impacts; (8) siting; (9) moratorium; and (10) health and safety. The Report also includes a number of appendices, as described in the preceding table of contents.

Board Hearing Officer Amy Jackson conducted seven days of public hearings at five locations: August 23 and 24, 2000, in Chicago; September 7, 2000, in Naperville; September 14, 2000, in Joliet; September 21, 2000, in Grayslake; and October 5 and 6, 2000, in Springfield. All seven Board Members attended each day of hearing. Over 80 persons testified, including individual citizens, representatives of citizen groups, representatives of State and local government, and representatives of industry. Please refer to Appendix B for a list of all hearing participants. The Board appreciates their assistance in developing this record.

A court reporter transcribed each hearing, resulting in nearly 1,300 pages of transcripts. The hearing transcripts have been available on the Board's Web site.[1] Hearing Officer Jackson admitted 69 hearing exhibits into the record, a list of which is attached as Appendix C.[2] In

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[1] The transcript pages for the first four hearing locations are numbered consecutively, *i.e.*, Chicago (pp. 1-364), Naperville (pp. 365-574), Joliet (pp. 575-735), and Grayslake (pp. 736-1,036). These pages are cited as "Tr.1 at [page number]." The transcript for the fifth and final hearing, in Springfield (pp. 1-263), is cited as "Tr.2 at [page number]."

[2] Hearing Officer Jackson identified hearing exhibits by the name of the participant submitting the exhibit, and by the number of exhibits submitted by the participant. Hearing exhibits are cited as "[participant] Exh. [number] at [page number]." Hearing exhibits submitted as a group of exhibits are cited as "[participant] Grp. Exh. [number] at [page number]."

addition, the Board received 195 written public comments, which also have been available on the Board's Web site. Please refer to Appendix D for a list of all public comments.[3] The Board thanks the commentors for their insights.

II. BACKGROUND ON PEAKER PLANTS

In this part of the Report, the Board summarizes information from the record on (1) defining "peaker plant," (2) simple cycle and combined cycle turbines, (3) the types of fuels used in turbines, and (4) the number and location of existing and proposed peaker plants.

A. Defining "Peaker Plant"

1. Information from State Government

Mr. Thomas Skinner, Director of the Illinois Environmental Protection Agency (IEPA),[4] explained when peaker plants operate:

> Peakers operate only during peak demand situations such as on hot summer days when residential and commercial usage of electricity creates more demands than the baseload plants that exist in Illinois make available. Tr.1 at 52.

In its "Peaker Power Plant Fact Sheet," IEPA further explained that peak demand in Illinois typically "occurs during the summer months when air conditioning load is high, and the nuclear and coal burning power plants cannot meet the demand for power." IEPA Grp. Exh. 2, No. 20.

2. Information from Industry

Mr. Gerald M. Erjavec, Manager of Business Development for Indeck Energy Services, Inc. (Indeck), described peaker plants:

> "Peaking" plants are so named because their practical use is limited to operating during periods of the highest or "peak" need for electricity. As can well be imagined, the use of electricity varies over the day. From periods of low use over night to the time of high use during the day, generating units are turned on, or dispatched, to meet the needs of the system . . . . During the highest demand period of the day, particularly in hot weather when there is more need for electricity to power air conditioners, the peaking units are dispatched on. Indeck Exh. 1 at 1.

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[3] Each public comment is assigned a number, beginning with the number one and continuing through 195. Public comments are cited as "PC [number] at [page number]."

[4] A list of abbreviations used in the Report is set forth in Appendix E.

According to Mr. Richard A. Bulley, Executive Director of Mid-America Interconnected Network, Inc. (MAIN), air conditioning can account for up to 40% of the load on hot summer days in Illinois. Tr.1 at 321.

Reliant Energy Power Generation, Inc. (Reliant), graphed the typical daily load curve to describe how electricity demand fluctuates. PC 1, Att. 1. The graph is set forth as Figure 1 in Appendix F of this Report. Reliant noted that there are three main categories of electricity demand: base, intermediate, and peak. Base-load demand is the constant demand for electricity that exists day and night, season to season. Reliant stated that base-load units "with low operating costs, such as nuclear and coal-fired plants, are ideally suited to run at full capacity at all times." PC 1 at 2. Intermediate demand rises and falls as the day goes on, and intermediate or load-following plants:

> [A]re ramped up and down to follow the daily load curve of electricity demand. * * * Together, [base-load and intermediate-load plants] cover most of the daily and seasonal fluctuations in demand. This, however, leaves a few hours in the year when unusually high demand peaks are encountered. * * * Peaking units—or peakers—are used to meet these spike demands for power. PC 1 at 2.

Mr. Richard Ryan of Standard Power and Light narrowed the definition of peak demand to a predictable calendar basis:

> Peak really means 5 by 16. It's five days a week, 16 hours a day. * * * You have on-peak and off-peak. On-peak months would be May through September, December, January and February. Off-peak would be all the out months. So you have on-peak and off-peak months and then you have on-peak and off-peak hours. Tr.1 at 427.

Commonwealth Edison Company (ComEd) noted that "electric power is not readily stored." ComEd Exh. 1 at 3. To respond efficiently and economically to peak needs for power, a "peak load plant, or peaker, can be started relatively quickly" to meet the demand not readily supplied by base or intermediate-load plants. ComEd Exh. 1 at 4. ComEd explained that peaker plants "have high hourly operating costs, but low capital costs compared to base load plants. Because of this cost structure, it is economical to supply peak load, in the relatively few hours required, using this type of plant." ComEd Exh. 1 at 4.

Besides meeting peak demand, peaker plants can address temporary shortages in power supply. Mr. Christopher Romaine, Manager of the Utility Unit in IEPA's Division of Air Pollution Control, explained:

> [I]f there is an unexpected outage of a power plant during the winter period of time, there is an event to be able to turn on the peaker plant. So that would be a

> time where we might call upon a peaker plant some other period of the year than summer. * * * [P]eaker plants can also be used to meet an emergency demand for power, when . . . there is a breakdown of a substation or power lines (assuming power can still be carried to the area where it is needed). Tr.1 at 179; IEPA Grp. Exh. 1, Romaine at 3.

Comparing summer and winter peak loads, ComEd noted that the all-time summer peak load was 21,243 megawatts (MW) on July 30, 1999, between 2:00 p.m. and 3:00 p.m. central time. ComEd's all-time peak load during a winter month was 14,484 MW on December 20, 1999, between 5:00 p.m. and 6:00 p.m. ComEd Exh. 1 at 3.

The Illinois Environmental Regulatory Group (IERG), an affiliate of the Illinois State Chamber of Commerce, stated:

> [T]he industrial community is adjusting to [electric industry] deregulation . . . by exploring the increased use of on-site co-generation facilities. These facilities are intended to provide both electricity and steam to the host facility. IERG Exh. 1 at 3.

Mr. Alan Jirik, Director of Environmental Affairs for Corn Products International, Inc. (CPI) testified that these co-generation units often use gas-fired turbines. Tr.1 at 631. He explained that the industrial community seeks not only to use co-generation units to produce steam for its operations, but also to sell any excess electricity on the grid. Tr.1 at 632.

However, IERG stressed that "a 'peaker plant' is very different from on-site units at an industrial facility, in terms of physical and operational characteristics, as well as financial investment and return." IERG Exh. 1 at 4. IERG encouraged the Board to restrict its findings to " 'peaker plants' and not to other types of electric generating facilities, be they on-site emergency generators, co-generation units or base-load power plants." IERG Exh. 1 at 4.

Similarly, Mr. Jirik of CPI emphasized that these industrial co-generation units should be distinguished from peaker plants:

> Industrial cogeneration units are typically base loaded as industrial processes demand a relatively constant supply of steam and electricity. This constant demand essentially precludes peak-only operation. Tr.1 at 631. * * * These units will provide steam and electricity to the manufacturing operation, and by virtue of their capacity, also provide electricity to the grid. We expect to maximize our sales to the grid during times of peak pricing, which usually occurs during periods of peak demand. However, these industrial cogen units differ from the peakers that are the subject of [these] hearing[s]. Tr.1 at 632.

3. Concerns of Citizens

Referring to the federal definition of a peaking unit,[5] Ms. Susan Zingle, Executive Director of the Lake County Conservation Alliance (LCCA), testified that "peaker plants are expected to operate about 10 percent of the time, approximately 876 hours." Tr.2 at 169. She noted that Director Skinner of IEPA, in a May 16, 2000 letter to the United States Environmental Protection Agency (USEPA) about regulating peaker plants, said that peaker plants "were expected to run about 20 days a year [or] . . . 300 hours." Tr.2 at 169. She contrasted this with "plants [in Illinois] claiming to be peakers [and] being permitted for 2,300, 3,300, 4,000 hours, not 300 to 900 [hours]." Tr.2 at 170. Ms. Zingle concluded:

> [T]otal demand on the ComEd system has been as high as about 21,000 [MW], so peaking power within MAIN should be about 2,000 [MW], not the 22,000 [MW] we have being permitted now. In the applications, most of these plants have some indication that they plan to operate year-round. I don't believe these are peakers. These are intermediate load plants. Tr.2 at 170.

After observing the Chicago hearings in August, Ms. Dianne Turnball, a consultant to several citizen groups, noted at the Naperville hearing that "[w]e keep talking about peaker plants and we seem to eliminate the combined cycle plants." Tr.1 at 434. She argued that the Board should address combined cycle plants. She also suggested that any rule changes should apply to independent power producers (IPPs), except those that operate base-load plants. Tr.1 at 435.

B. Simple Cycle and Combined Cycle Turbines

1. Information from State Government

Recently, most power plant air permit applications filed with IEPA have been for natural gas-fired, simple cycle combustion turbines ranging in capacity from 25 to 187 MW per turbine. PC 168, Att. 2. However, not all natural gas-fired peaker plants are simple cycle. PC 9 at 31. IEPA noted:

> All power plants are used to meet peak electricity demands. During periods of peak electricity demand, base-load power plants and the cyclic [intermediate or load-following] power plants are in service, which would also include combined cycle plants. PC 9 at 31.

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[5] "Peaking Unit means: (1) A unit that has: (i) An average capacity factor of no more than 10.0 percent during the previous three calendar years and (ii) A capacity factor of no more than 20.0 percent in each of those calendar years . . . ." 40 C.F.R. § 72.2.

Mr. Romaine of IEPA described a gas turbine and explained how it works. A "gas turbine is a rotary internal combustion engine with three major parts . . . an air compressor, burner(s) or combustion chamber, and a power turbine." Tr.1 at 75. The air compressor compresses incoming air, diverting a portion to the burners where the fuel is burned. "This very hot gas is mixed with the rest of the compressed air and passes through the power turbine." Tr.1 at 75. The hot compressed gas expands to push the blades of the power turbine. "The power turbine turns the generator and makes electricity." Tr.1 at 76.

Mr. Romaine also discussed the differences between simple cycle and combined cycle gas turbines. With simple cycle turbines, the "waste heat from the exhaust from the gas turbine is directly discharged to the atmosphere with the exhaust gases." Tr.1 at 76. With combined cycle turbines:

> [T]he hot exhaust gases discharged from the turbine . . . are ducted through a waste heat boiler and used to generate steam. This steam is then used to drive a steam turbine generator, as in more traditional steam power plants. * * * The recovery of heat energy in the exhaust of a gas turbine in this combined cycle fashion can increase the energy efficiency of a combined cycle plant by about 50 percent as compared to a simple cycle turbine . . . ." Tr.1 at 77-78.

The generation capacity of simple cycle plants ranges from 25 to 800 MW per plant. The generation capacity of combined cycle plants ranges from 336 MW to 2,500 MW. PC 168, Att. 1.

2. Information from Industry

Mr. Erjavec of Indeck presented a diagram of simple cycle and combined cycle natural gas-fired plants. This diagram is set forth as Figure 2 in Appendix F of this Report.

3. Information from Citizens

Natural Resources Defense Council (NRDC) stated that "[c]ombustion turbines, particularly combined cycle applications are capable of obtaining 55-60% efficiencies . . . . Single cycle natural gas-fired combustion turbines are considerably less efficient, operating between 28-35% with combustion controls limiting [nitrogen oxides] NO_x emissions to 15-25 ppm [parts per million]." PC 109 at 5.

C. Fuels Used

1. Information from State Government

"Gas turbines . . . rely on the availability of a supply of clean fuel such as natural gas, kerosene, or light oil. Note that gas turbines are called 'gas' turbines because the working

fluid is a hot gas, not because they burn natural gas." IEPA Grp. Exh. 1, Romaine at 5. Mr. Romaine of IEPA noted that all air permit applications filed with IEPA have "proposed the use of natural gas as their primary fuel, but some applications have also included provisions to have fuel oil as a backup fuel." Tr.1 at 178. He confirmed that some plants originally intended for natural gas may ultimately use a different fuel should the market allow: "the plants that are going in with fuel oil capacity are really looking at being able to supply the winter peaking market." Tr.1 at 178.

Other fuels typically used for peak applications in Illinois include diesel, ethane, jet fuel, fuel oil, #2 oil, and distillate oil. IEPA Grp. Exh. 2, Att. 8, 9. According to Mr. Romaine, the fuel type dictates the character of the air emissions. As for plants using oil, Mr. Romaine noted that "emissions would certainly be higher." Tr.1 at 179. "Certainly it is more difficult to control [nitrogen oxides] NO_x as compared to oil than it is burning natural gas. Oil has more ash than natural gas. Oil has some fats [that create] sulfur dioxide [SO_2]." Tr.1 at 180.

2. Information from Industry

Mr. Erjavek of Indeck noted that light oil or diesel can be used to fuel gas turbines, but that this practice is not as common in the United States as in other countries. Tr.1 at 225.

3. Concerns of Citizens

Ms. Carol Dorge, an attorney and Director of LCCA, expressed concerns about air pollution from diesel fuel: "We also note that some of these facilities are being permitted to use diesel fuel. They say they are using diesel for back up, but back up is not defined in their applications or their draft permits." Tr.1 at 450.

D. Number and Location of Existing and Proposed Peaker Plants

1. Information from State Government

Director Skinner of IEPA noted the increasing number of peaker plant air permit applications that IEPA has received over the past year and a half: "We seem to get more every day." Tr.1 at 51. As Director Skinner explained, the total number of peaker plants depends on whether you are counting "facilities" or "units." A facility may have multiple units or turbines. As of the August 24, 2000 Chicago hearing, IEPA had received permit applications for 46 facilities. Tr.1 at 48.

Mr. Romaine stated:

> These plants are being proposed throughout the state, not only in rural areas where new power plants were historically sited, but also in developed and

> developing areas in the greater Chicago metropolitan area. In the Chicago area, some plants are being sited for existing industrial locations, but many have selected sites that are not in industrial areas and might be best characterized as open, often close to residential areas. * * * Like the existing peaker plants, some [peaker plants being proposed by historic utilities] are occuring at or adjacent to existing coal-fired power plants. IEPA Grp. Exh. 1, Romaine at 3-4.

As of November 6, 2000, IEPA listed 67 air permits for existing and proposed power plants using simple or combined cycle turbines. PC 168, Att. 2. A table and corresponding map based on information from IEPA are set forth as Table 1 and Figure 3, respectively, in Appendix F of this Report. Of the 67 air permits, 36 are for locations in ozone attainment areas while 31 are in nonattainment areas (NAAs); 9 are for existing facilities while 58 are for proposed facilties; 8 are for base load, 56 for peak load, and 3 for either base or peak load. If all of the proposed facilities are built, total electrical capacity contributed by existing and proposed gas-fired simple cycle and combined cycle plants will be 27,329 MW. IEPA Grp. Exh. 2, No. 7; PC 168, Att. 2.

Mr. Charles Fisher, Executive Director of the Illinois Commerce Commission (ICC), provided a USEPA document entitled National Combusion Turbine Projects, which lists combustion turbine facilities across the United States that have draft permits or recently-issued final permits. PC 8. A map based on this information is set forth as Figure 4 in Appendix F of this Report.

2. Concerns of Citizens

As described throughout this Report, individual citizens and citizen groups consistently expressed concerns over the growing number of proposed peaker plants, the proposed locations of the plants (including clustering), and the resulting impacts to the environment.[6]

III. AIR EMISSIONS

In this portion of the Report, the Board summarizes record information on (1) the general concerns of citizens about air pollution, (2) the type and amount of air emissions from peaker plants, (3) air pollution control regulations, (4) air emissions control technology, (5) air quality modeling, (6) air quality impacts, and (7) other specific concerns of citizens about air pollution.

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[6] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

A. Concerns of Citizens—Generally

Potential air pollution from peaker plants was a major concern of individual citizens and citizen groups testifying before the Board. In general, they were concerned about (1) the impact on local air quality, *i.e.*, in the vicinity of peaker plants, (2) the impact on regional air quality, including attaining the National Ambient Air Quality Standards (NAAQS), (3) the adequacy of existing regulations and permit requirements to address the unique aspects of peaker plant air emissions, and (4) the adequacy of emission control technology that peaker plants use.

Citizens argued that peaker plants need to be regulated more strictly than current air quality regulations provide. Tr.1 at 458, 919, 994-995; Tr.2 at 113 and 186. They asserted that peaker plants pose a unique threat with respect to air pollution when compared to other types of State-regulated facilities. Tr.1 461, 994-995 and Tr.2 at 188. Further, they argued that if the Board determines that peaker plants should be more strictly regulated or restricted, the new regulations or restrictions should apply both to existing and new facilities. Tr.2 at 189-190.

Specific concerns that individual citizens and citizen groups raised about particular air emission subjects are summarized below when the record information on the particular subject is summarized.

B. Type and Amount of Air Emissions

1. Information from Citizens

Many individual citizens and citizen groups expressed concern about the large amounts of pollutants that peaker plants may emit during the summer months. Tr.1 at 646, 788, 923, 980. Ms. Carol Stark, Director of Citizens Against Ruining the Environment (CARE), stated that emissions of nitrogen oxides (NO_x) and volatile organic material (VOM) on hot summer days contribute significantly to the formation of ground level ozone. Tr.1 at 646. She asserted that it is not acceptable to have peaker plants in the NAA, which contains "some of the major polluters in the State." Tr.1 at 646.

Ms. Lucy Debarbaro of Citizens Against Power Plants in Residential Areas (CAPPRA) expressed concern about the emission of greenhouse gases. She stated that carbon dioxide (CO_2) emissions from power plants significantly impact global climate change. Tr.1 at 497. Ms. Debarbaro maintained that if CO_2 emissions continue to increase, the greenhouse effect may cause an irreversible large-scale impact on the environment. Tr.1 at 497.

2. Characteristics of Air Emissions

a. Information from Government. Mr. Romaine of IEPA testified about the characteristics of air emissions from peaker plants. He has extensive experience in air pollution control, including permitting peaker plants. IEPA Grp. Exh. 1, Romaine at 1-2. The characteristics of peaker plant air emissions were also addressed by Versar, Inc. (Versar), an environmental consultant. Versar was retained by the DuPage County Department of Development and Environmental Concerns to review environmental issues related to peaker plants. DuPage County Board Exh. 1 at 1.

Mr. Romaine stated that peaker plants emit air pollutants because they burn large amounts of fossil fuel to generate electricity. He stated that these pollutants are combustion byproducts and include NO_x, carbon monoxide (CO), VOM, particulate matter (PM), and sulfur dioxide (SO_2). Tr.1 at 83-84; IEPA Grp. Exh. 1, Romaine at 10-11; see also DuPage County Board Exh. 1 at 14. Mr. Romaine stated that NO_x emissions are of particular interest in part because gas turbines emit more NO_x than the other pollutants. IEPA Grp. Exh. 1, Romaine at 10. Versar stated that "NO_x and CO are the pollutants emitted in the greatest amount from a gas-fired turbine . . . ." However, CO generally causes less concern than NO_x "because NO_x plays a role in ozone formation." DuPage County Board Exh. 1 at 14.

Mr. Romaine relied on a USEPA publication entitled Alternative Control Techniques Document—NO_x Emissions from Stationary Gas Turbines to address NO_x emissions from peaker plants. IEPA Grp. Exh. 2, No. 2. Gas turbines form NO_x in three ways. The primary way involves forming "thermal NO_x." Thermal NO_x is formed in the gas turbine combustor from a series of chemical reactions. Nitrogen and oxygen in the combustion air dissociate and subsequently react to form the different NO_x. The second way involves forming "prompt NO_x." Prompt NO_x is formed from early reactions of nitrogen in combustion air and hydrocarbon radicals in fuel. The third way involves forming "fuel NO_x." Fuel NO_x is formed from reactions between the fuel bound nitrogen compounds and oxygen. Because natural gas has a negligible amount of fuel-bound nitrogen, "[e]ssentially all NO_x formed from natural gas combustion is thermal NO_x." IEPA Grp. Exh. 2, No. 2 at 3.1-3.

The reaction between nitrogen and oxygen leads to the formation of seven known oxides of nitrogen. However, only nitric oxide (NO) and nitrogen dioxide (NO_2) are formed in sufficient quantities to be significant in air pollution. IEPA Grp. Exh. 2, No. 4 at 4-1. The formation rate of thermal NO_x increases exponentially with increase in temperature. In addition, NO_x formation in gas turbines is influenced by the combustor design, fuel type, ambient conditions, operating cycles, and power output level. IEPA Grp. Exh. 1, Romaine at 10; IEPA Grp. Exh. 2, No. 4 at 4-6.

The combustor design is considered the most important factor affecting NO_x formation because flame temperature, fuel/air mixing, and residence time are controlled by the turbine design. The type of fuel used to fire the turbine affects NO_x emission levels. NO_x emissions are higher for fuels that burn at high flame temperatures. Ambient conditions, such as humidity, temperature, and pressure, also affect NO_x formation. Regarding operating cycles

(simple/combined), NO_x emissions from identical turbines used in a simple cycle and a combined cycle plant would have similar NO_x emission levels, as long as a duct burner is not used in the heat recovery applications of the combined cycle plant. A duct burner is a supplemental burner used in combined cycle plants to increase the temperature of exhaust heat from the gas turbine and thereby produce the desired quantity of steam. With a duct burner, the NO_x emissions level for the combined cycle plant would be higher than that for the simple cycle plant. IEPA Grp. Exh. 2, No. 4 at 4-12.

Regarding other air pollutants, Mr. Romaine stated that CO is formed from incomplete combustion when there is insufficient residence time at high temperatures or incomplete mixing. IEPA Grp. Exh. 1, Romaine at 10. He also noted that gas turbines emit small amounts of VOM. VOM also results from incomplete combustion. Mr. Romaine stated that forming both CO and VOM depends on the loading of the gas turbine. A gas turbine operating under full load will emit lower levels of CO and VOM because full load results in higher fuel efficiency. Higher fuel efficiency in turn reduces the formation of CO and VOM. However, higher fuel efficiency is more conducive to NO_x formation. Thus, Mr. Romaine asserted that when combustion modification is considered for reducing NO_x emissions, compensatory steps must be taken to maintain or even improve combustion efficiency. IEPA Grp. Exh. 1, Romaine at 11.

Mr. Romaine stated that PM results mainly from the noncombustible trace constituents present in the fuel. He noted that natural gas-fired turbines emit negligible amounts of PM. Mr. Romaine stated that even turbines burning distillate oil emit very low amounts of PM due to the low ash content of the fuel oil. IEPA Grp. Exh. 1, Romaine at 11. Versar stated that natural gas is inherently clean burning fuel, and gas-fired turbines generally achieve a level of combustion efficiency so as to be considered small sources of VOM and PM. DuPage County Board Exh. 1 at 14. Mr. Romaine stated that peaker plants emit very low levels of SO_2. SO_2 results from burning sulfur compounds present in the fuel. He noted that SO_2 emissions are not a concern with natural gas-fired turbines. However, SO_2 is emitted at higher levels by oil-fired turbines because of the higher sulfur content of oil. IEPA Grp. Exh. 1, Romaine at 11.

b. Information from Industry. Maintaining that air emissions from peaker plants will be very low, Mr. Erjavec of Indeck compared a proposed peaker plant's air emissions with the emissions of a number of different types of sources and the NAAQS. Tr.1 at 246-247; Indeck Exh. 2, Average Permitted CO Emissions. He noted that the peaker plant's emissions would be in the mid-range when compared to other sources, such as steelworks, refineries, foundries, coal-fired power plants, and airports. Tr.1 at 248. The comparison also illustrated that the peaker plant's emission levels would be significantly lower than the applicable NAAQS. Indeck Exh. 2, Air Quality Impacts. According to Indeck, the emissions are low because: peaker plants use clean burning natural gas; are equipped with low NO_x burners; and are designed to operate only during peak-load demand. Indeck Exh. 2, Representative Impact Documentation.

3. Quantity of Air Emissions

a. Information from Government. Information on rates and amounts of pollutants that peaker plants emit into the air focused mainly on NO_x because peaker plants emit large quantities of NO_x and NO_x is an ozone precursor. Tr.1 at 85; IEPA Grp. Exh. 2, No. 4 at 4-6. The amount of NO_x emitted from a particular gas turbine model depends on design factors, fuel type, operating mode, and ambient conditions. IEPA Grp. Exh. 2, No. 4 at 4-6. Mr. Romaine testified that "the preferred source of information [on] the expected emissions of a particular model of turbine is the manufacturer of the turbine." Tr.1 at 85.

Mr. Romaine stated that turbine manufacturers provide data sheets that include maximum expected emissions under different operating, load, and ambient conditions. IEPA Grp. Exh. 1, Romaine at 11. Manufacturers provide the amount of uncontrolled air emissions from peaker plants in parts per million by volume (ppmv), which is converted to pounds per hour based on turbine power output, heat rate, and fuel properties. IEPA Grp. Exh. 2, No. 4 at A-1. Versar stated that by knowing the number of hours per year the plant operates, the amount of air emissions for a particular pollutant may be calculated on a tons per year (TPY) basis. DuPage County Board Exh. 1 at 14-15.

USEPA has published the uncontrolled NO_x emission factors based on manufacturers' data for a number of gas turbine models. IEPA Grp. Exh. 2, No. 4 at 2-2. These emission factors range from 0.397 to 1.72 lbs NO_x/mmBtu (million British thermal unit) (99 to 430 ppmv) for natural gas and from 0.551 to 2.50 lbs NO_x/mmBtu (150 to 680 ppmv)for distillate oil fuels. Mr. Romaine stated that actual emission rates may be determined by measuring the amount of pollutants in the turbine exhaust as it passes through the stack. Tr.1 at 85.

b. Information from Industry. Mr. Erjavec of Indeck presented air permitting information on total emissions for a proposed 300-MW peaker plant in Libertyville. The plant's two turbines, when operated according to permit limits over a period of 2,000 hours, would emit 173 tons of NO_x, 105.4 tons of CO, 20 tons of PM, and 1 ton of SO_2. Indeck Exh.1, Att.

4. Start-Up, Shut-Down, and Low Load Emissions

a. Information from Citizens. Citizens were concerned about peaker plants emitting greater amounts of pollutants when starting up, shutting down, and operating at low load. Tr.1 at 789, 995, 998, 1,024; Tr.2 at 139, 148. Dr. William McCarthy, a resident of Libertyville, stated that emissions during peaker plant start-up and shut-down would account for a large part of the total emissions from peaker plants. Tr.1 at 995. He said that peaker plants produce up to 200 parts per million (ppm) of NO_x during start-up (when plants operate at less than 50% load capacity), compared to NO_x emissions of 10 to 30 ppm during full-load operation. Tr.1 at 999-1,000. Ms. Dorge of LCCA also noted that peaker plant emissions are

much higher during start-up, particularly emissions of CO and VOM. Tr.1 at 451; Tr.2 at 149.

Dr. McCarthy stated that Illinois regulations do not specifically address emissions during start-up and shut-down of peaker plants. Tr.1 at 998. He noted that because peaker plants do not have any restrictions on how many times they can start up or shut down, a plant may turn on and off many times on a given day based on market conditions, producing large quantities of emissions. Tr.1 at 1,000-1,001.

Dr. McCarthy submitted a California Air Resources Board publication entitled Guidance for Power Plant Siting and Best Available Control Technology, which recommends that start-up and shut-down emissions be regulated by a separate set of limits to optimize emission control. Tr.1 at 999; McCarthy Exh. 2 at 36-37. The guidance document is intended to assist the various air districts within that state in making permitting decisions. McCarthy Exh. 2 at 3. The guidance document notes that natural gas-fired power plants operate with varying loads and have numerous start-ups and shut-downs, which can contribute substantially to total annual emissions. It recommends that enforceable permit emission limits be set for turbine emissions at all potential loads. The guidance document also states that permit conditions must address limits on the number of daily and annual start-ups and shut-downs, as well as monitoring the duration and quantity of start-up and shut-down emissions. McCarthy Exh. 2 at 60.

Ms. Dorge of LCCA urged that the Board adopt regulations requiring turbine manufacturers to provide information on start-up and shut-down emissions, alleging that the manufacturers are reluctant or unwilling to provide the information. Tr.1 at 452, 455.

b. Information from Government. IEPA stated that gas turbines emit greater amounts of pollutants during start-up and shut-down, including NO_x, CO, and VOM. This occurs because combustion efficiency will be at its lowest when fuel is first ignited and emission control techniques are not effective until flows and temperature in the turbine exhaust reach certain minimum levels. PC 9 at 13. IEPA acknowledged that emissions during start-up and shut-down are higher when expressed as an emission factor (pounds of pollutant per mmBtu heat input). However, IEPA noted that actual emissions may not be higher when expressed in pounds per hour because the lower heat input during start-up and shut-down compensates for the higher emission factor. PC 9 at 14.

IEPA relied on actual air quality monitoring information from the Elwood Energy facility to illustrate that NO_x emissions during an hour with start-up are similar or slightly higher than those during an hour of normal operation. PC 168 at 9. IEPA stated:

> The CEMS [continuous emissions monitoring system] data shows that the peaking turbines presently at Elwood Energy normally operate at about 0.05 to 0.055 lb NO_x/mmBtu. (The permit limit is 0.061 lb/mmBtu, based on an

> exhaust concentration of 15 ppm NO_x.) During startup, NO_x emissions are in the range of 0.1 to 0.115 lb/mmBtu. Of course, the average firing rate during a startup is about half of the turbines' capacity. This indicates that startup of these peaking turbines does not significantly change the hourly NO_x emissions of these turbines. PC 168 at 10.

IEPA cautioned that a different conclusion would be reached with new turbines being added to the Elwood Energy facility—because the new units are required to comply with a lower emission rate during normal operation. IEPA noted that if the start-up emission rate remained the same as with the existing turbines, the emissions during an hour with start-up could be about 25% higher than those during a normal hour of operation. PC 168 at 10.

IEPA asserted that higher levels of emissions accompanying start-up and shut-down occur over a relatively short period (15 to 30 minutes) and do not appear to pose an extraordinary concern for air quality. IEPA stated that start-up and shut-down emissions are another example of how emissions from particular units can vary, which must be addressed during permitting. PC 9 at 14. IEPA noted that it requires peaker plant permit applicants to account for all emissions (including emissions during start-up and shut- down) when demonstrating compliance with annual emission limits. PC 9 at 15. IEPA acknowledged that construction permits generally do not have specific emission limits for start-up and shut-down. However, IEPA contended that specific limits are necessary only when elevated emissions during those periods would threaten air quality. IEPA also noted that permit provisions require that peaker plants implement measures to minimize emissions associated with start-up and shut-down. PC 9 at 15.

IEPA explained that separate short-term permit limits are set if needed to protect ambient air quality during low-load operation. PC 9 at 16. IEPA relies on the results of air quality modeling to determine whether any particular turbine operation, such as low-load operation, would threaten air quality. PC 9 at 28.

C. Air Pollution Control Regulations

1. Information from Citizens

Citizens expressed concern about the adequacy of existing air pollution control regulations to address peaker plant emissions. They believe that peaker plants need to be regulated more strictly than other sources of air pollution. Tr.1 at 450, 514, 782. They addressed a number of specific issues concerning air pollution control regulations, including regulating peaker plants as major sources, the New Source Performance Standard (NSPS) for NO_x, the NO_x waiver, start-up and shut-down emissions, and permitting. This information is summarized below.

a. Regulating Peaker Plants as Major Sources of Air Pollution. Individual citizens and citizen groups argued that peaker plants, which are generally being permitted as minor sources of air pollution, should be regulated as major sources of air pollution. Tr.1 at 453, 466, 514, 787. Ms. Zingle of LCCA testified that peaker plants restrict their hours of operation or fuel consumption to limit NO_x emissions below 250 TPY, thereby avoiding major source status. Tr.1 at 514. As minor sources, she contended, peaker plants escape all but minimal air regulations. Ms. Zingle maintained that limiting emissions to stay below the 250 TPY threshold in no way limits the operating capacity of peaker plants because their emissions come in just three summer months. Tr.1 at 512-516.

Ms. Dorge of LCCA also maintained that peaker plants should be regulated as major sources of air pollution because they operate as major sources during the ozone season. Tr.1 at 453. Ms. Sandy Cole, the Lake County Board Commissioner for the 11th District, similarly stated that peaker plants must be evaluated on the basis of daily emission rate. Tr.1 at 787; Lake County Exh. 2 at 1. She asserted that because peaker plants operate only during times of need, their annual emissions generally fall within the minor source category, making it easy for companies to obtain permits. Tr.1 at 788.

b. NSPS for NO_x. A number of citizens noted that the existing NSPS for NO_x has become obsolete. Tr.1 at 454, 1,006. Dr. McCarthy stated that the existing NO_x NSPS of 75 ppm, which was adopted 13 years ago, has become outdated. Tr.1 at 1,006. Ms. Dorge stated that peaker plants equipped with dry-low NO_x combustion routinely achieve 9 ppm under normal operations. Tr.1 at 454.

c. NO_x Waiver. A number of citizens and citizen groups expressed concern regarding the NO_x waiver that USEPA granted to the State of Illinois for the Lake Michigan NAA. Tr.1 at 683; Tr.2 at 106, 116. Mr. Keith Harley of the Chicago Legal Clinic testified on behalf of ten environmental and citizen groups concerning the NO_x waiver. He stated that generally a new source of NO_x in a NAA for ozone, such as the Chicago metropolitan area, would be regarded as a major source if the source had the potential to emit 25 TPY of NO_x. Tr.1 at 683-684. Mr. Harley noted that under the federal Clean Air Act's (CAA) New Source Review (NSR) regulations, this major source would be subject to the most stringent pollution control measure called the Lowest Achievable Emission rate (LAER) and would be required to acquire NO_x offsets in the ratio of 1.3 to 1. Tr.1 at 684.

However, Mr. Harley noted that in mid-1990s the State of Illinois obtained a NO_x waiver from USEPA that relieved the sources in the Chicago NAA from NSR requirements, including the major source designation threshold of 25 TPY of NO_x. Tr.1 at 684. He stated that the NO_x waiver was granted on the basis of preliminary information suggesting that reducing NO_x emissions in the NAA would not reduce ozone levels in the NAA. Tr.1 at 685. Mr. Harley asserted that because of the NO_x waiver a peaker plant is not considered a major

source unless it emits 250 tons of NO_x per year. He noted that it is not a coincidence that all peaker plants are being permitted below the 250 TPY threshold. Tr.1 at 685-686.

Mr. Harley stated that since the granting of the NO_x waiver, the basis for the waiver has been discredited by the USEPA-appointed Ozone Transport Assessment Group (OTAG). Tr.1 at 686. He noted that the OTAG's comprehensive study demonstrated that NO_x reductions locally and regionally reduce ozone levels in the NAA. Mr. Harley stated that USEPA responded to the OTAG findings by imposing statewide NO_x reductions in a number of states, including Illinois, *i.e.*, the NO_x State Implementation Plan (SIP) call. However, no action has been taken to reconsider the Illinois NO_x waiver. Tr.1 at 686.

Mr. Harley asserted that the NO_x waiver provides a loophole for peaker plants to be built in the Chicago NAA. He maintained that Illinois could voluntarily request USEPA to rescind the NO_x waiver. Tr.1 at 687. Mr. Harley noted that he has filed a petition with USEPA requesting the federal agency to rescind the NO_x waiver for the Chicago NAA. Tr.1 at 688. Mr. Harley's position on the NO_x waiver was echoed by Mr. Brian Urbaszewski, the Director of Environmental Health Programs for the American Lung Association of Metropolitan Chicago (ALAMC) and a board member of the Illinois Environmental Council (IEC). Tr.2 at 107. Mr. Urbaszewski testified that Governor Ryan should request USEPA to repeal the NO_x waiver. Tr.2 at 116.

NRDC recommended that USEPA "withdraw the section 182(f) NO_x waiver granted to the Chicago . . . ozone [NAA], which exempts proposed new single cycle combustion turbines from obtaining emission offsets or utilizing best available control technology [BACT]." PC 109 at 6.

d. Regulating Start-Up and Shut-Down Emissions. A number of citizens expressed concern regarding the higher emission levels during start-up and shut-down of peaker plants. Dr. McCarthy stated that Illinois does not regulate start-up and shut-downs of peaker plants. Tr.1 at 998. He noted that peaker plants do not have any restrictions on how many times they can start and shut down. Accordingly, on any given day, based on market conditions, a plant may turn on and turn off many times, producing large quantities of emissions. Tr.1 at 1,000-1,001. Ms. Dorge asserted that some of the peaker plants that IEPA permitted as minor sources (NO_x emissions less than 250 TPY) would be major sources if start-up emissions were included in the overall annual emissions. Tr.2 at 149.

e. Permitting Issues. Ms. Dorge testified that regulations should better define the permit application requirements. Tr.1 at 458. She stated that every peaker plant permit application should include information on duration and expected frequency of start-up and shut-down emissions, good operating practices, operating factors affecting emission rates, standard procedures for calculating emission rates during all operational modes, monitoring procedures, operator information, operator training, and contractual warranties. Tr.1 at 455-457.

Further, Ms. Dorge stated that it is important to know what constitutes a complete permit application. Using a permit application that Carlton, Inc. filed as an example, Ms. Dorge identified what she considers to be a number of inconsistencies and deficiencies in the information that the applicant provided. Tr.2 at 144-147.

Ms. Turnball expressed concern regarding public access to permit information. Tr.1 at 441. She suggested that the permit applicant should be required to provide public notice concerning the proposed plant to all property owners within 500 feet of the proposed facility. Ms. Turnball also stated that all information that an applicant provides in an air permit application should be verified by actual operating data. Tr.1 at 438. Dr. McCarthy noted that there is no need to have any operating data to obtain a construction permit in Illinois. Tr.1 at 1,007. In addition, Ms. Turnball urged the Board to make permanent the requirement for a public hearing on construction permits for peaker plants that is currently being imposed at the discretion of IEPA Director Skinner. Tr.1 at 513.

f. NO_x SIP Call. Ms. Dorge stated that the 40 or so proposed peaker plants would account for approximately 10,000 tons of NO_x per year compared to roughly 30,000 tons allocated to Illinois under the proposed NO_x trading program. Tr.1 at 450. She noted that this comparison clearly shows that peaker plant contribution to the ozone problem will be significant. Tr.1 at 450. Ms. Zingle also expressed concern regarding the implications of siting a large number of peaker plants on existing NO_x emitters in the context of the NO_x SIP call. Tr.1 at 660.

Mr. Larry Eaton is an attorney formerly with the Illinois Attorney General's office in environmental enforcement. Mr. Eaton testified on behalf of three organizations associated with the conservation community known as Prairie Crossing: Prairie Crossing Homeowners Association; Liberty Prairie Conservancy, a foundation dedicated to preserving Prairie Crossing and other communities; and Prairie Holdings Corporation, the developer of Prairie Crossing. Tr.1 at 864, 905; Eaton Exh. 1 at 1. Mr. Eaton stated that the NO_x SIP call requires Illinois to quickly and radically reduce NO_x emissions. Tr.1 at 882. He asserted that the SIP call demonstrates the need for better planning and regulations for power plant industry. Tr.1 at 883.

Mr. Patricio Silva, Midwest Activities Coordinator of NRDC, stated that, while the NO_x SIP call is a tool to achieve the one-hour ozone standard, it will have a technology forcing

edge. Tr.2 at 90. However, Mr. Silva asserted that the NO_x waiver will negate the use of innovative technology. He argued that the allocation methodology under the proposed SIP call regulations favor the existing sources at the expense of future sources with cutting-edge technology. Tr.2 at 91.

Mr. Urbaszewski of ALAMC and IEC echoed Mr. Silva's concern regarding the allocation methodology under the proposed NO_x SIP call rules. Tr.2 at 111. Further, he asserted that the NO_x allocation methodology does not support energy efficiency and renewable energy projects. Tr.2 at 112. Mr. Urbaszewski did not agree that the NO_x SIP call would address all the concerns related to NO_x emissions from peaker plants. Mr. Urbaszewski stated that the new units may have to import allocations from other states in the trading region because a very small portion of the NO_x budget is set aside for these new sources under the proposed allocation methodology. Tr.2 at 122. He argued that the amount of allowances imported would go down if peaker plants are required to emit NO_x at low levels. Tr.2 at 122.

2. Information from Government

Mr. Romaine of IEPA testified about the air pollution control regulations governing the peaker plants. Tr.1 89-93; IEPA Grp. Exh. 1, Romaine, Att. 1. He explained the applicability of the federal regulations:

> If emissions from a proposed new source of air pollution or from a modification to an existing source are considered major, the source must undergo federal . . . NSR . . . analysis as part of the construction permitting process. Different NSR rules govern areas that attain the . . . NAAQS . . . for pollutants and in areas that do not attain the NAAQS. These national standards are established by [USEPA] under Section 109 of the [CAA] (42 U.S.C. Section 7401-7661q (CAA) and are set at a level that protects the public health with an adequate margin of safety and protects public welfare from known or anticipated adverse effects. Peaker plants emit the following pollutants for which [USEPA] has established national standards: . . . NO_2 . . . , . . . PM . . . SO_2 . . . CO . . . . In addition, . . . VOM . . . and sometimes . . . NO_x . . . emissions, both of which are emitted by peaker plants are subject to regulation as precursors to ozone. Attainment NSR is addressed under the Prevention of Significant Deterioration (PSD) program found at 40 C.F.R. Section 52.21. IEPA Grp. Exh. 1, Romaine, Att. 1 at 1.

Further, Mr. Romaine explained that if "an area does not attain the NAAQS, it is considered a [NAA] and proposed new or modified major sources are subject to nonattainment NSR . . . . Illinois' [nonattainment] NSR requirements are found at 35 Ill. Adm. Code 203." IEPA Grp. Exh. 1, Romaine, Att. 1 at 2.

a. Prevention of Significant Deterioration (PSD) of Air Quality. Versar, environmental consultant for the DuPage County Department of Development and Environmental Concerns, also discussed the air pollution control regulations. DuPage County Board Exh. 1 at 27. Versar stated that the PSD program is designed "to ensure that the current NAAQS levels are not degraded such that exceedences of the standard would occur." DuPage County Board Exh. 1 at 28. Mr. Romaine stated that IEPA implements the federal PSD regulations under a delegation agreement with USEPA. IEPA Grp. Exh. 1, Romaine at 13. Mr. Romaine explained the applicability of PSD to peaker plants:

> Under PSD, a new source or a modification to an existing minor source is considered major if potential emissions of a pollutant are 250 [TPY] or more unless the source is one of the listed categories at 40 CFR Section 52.21(b)(1)(i)(a). If a source is one of the listed categories, it is considered major if its potential emissions of a pollutant are 100 [TPY] or more. *Id*. This list includes fossil fuel steam electric plants of more than 250 [mmBtu] per hour of heat input. Peaker plants that use simple cycle gas-fired turbines are not covered by this category or any other listed categories, as the turbines used in peaker plants do not generate steam. Therefore, the PSD threshold for simple cycle peaker plants is 250 [TPY]. If the gas-fired turbine produces electricity by steam through a waste recovery system, often referred to as combined cycle turbines, the plant would be reviewed under the 100 [TPY] or more threshold. Once a proposed source qualifies as major for one pollutant, other pollutants only need be emitted in a significant amount, as defined at 40 CFR Section 52.21(b)(23) to be subject to PSD. IEPA Grp. Exh. 1, Romaine, Att. 1 at 1-2.

Mr. Romaine stated that PSD can have an effect on peaker plants because a plant that qualifies as major for a pollutant is subject to additional requirements for that pollutant. He noted that a major plant must be operated to comply with control requirements that represent BACT for the pollutant, as determined and approved on a case-by-case basis during issuance of the construction permit for the project. IEPA Grp. Exh. 1, Romaine at 13. In addition, Mr. Romaine explained that a permit applicant for a major source or modification "must perform modeling to determine the air quality impact of its proposed project, using dispersion modeling for pollutants other than ozone." IEPA Grp. Exh. 1, Romaine, Att. 1 at 2. He added:

> To address the air quality impacts from individual sources of ozone precursors, [USEPA] has developed screening tables based on generic airshed ozone modeling. Dispersion modeling is not relied upon under PSD to address the air quality impact from ozone precursor emissions because ambient ozone is formed by atmospheric reactions of precursor compounds and the impact of a single source cannot typically be measured through modeling. IEPA Grp. Exh. 1, Romaine, Att. 1 at 2.

Mr. Romaine discussed the applicability of PSD to peaker plants to address public concern over why all peaker plants are not considered major sources. He stated that the need for a PSD permit is triggered for a new peaker plant if the permitted emissions of a pollutant (NO_x, SO_2, CO, PM, or VOM) that the applicant requests equal or exceed the major source threshold for PSD. IEPA Grp. Exh. 1, Romaine at 14. Mr. Romaine noted that the major source threshold for PSD is set at annual emissions of 100 tons or more for 28 listed categories, and 250 tons for all other categories of sources. IEPA Grp. Exh. 1, Romaine at 15. Further, regarding the issue of why the PSD program is not applied on the basis of seasonal emissions, *i.e.*, summer months, Mr. Romaine maintained that the applicability provisions of the PSD rules do not provide a basis to trigger applicability of PSD on any emission totals other than annual emissions. He noted that Section 169 of the federal CAA clearly provides that for purposes of PSD, major sources are to be defined in terms of their annual emissions. Mr. Romaine stated that peaker plants are not the only plants that are seasonal in nature. He noted that some boilers at heating plants operate primarily in winter. IEPA Grp. Exh. 1, Romaine at 15-16.

Mr. Romaine also addressed the issue of why IEPA was considering PSD for NO_x in the Chicago NAA. He stated that if NO_x was considered an ozone precursor in the NAA, a proposed peaker plant would have to comply with the Major Stationary Sources Construction and Modification (MSSCAM) regulations. The applicability threshold for MSSCAM is annual emissions of 25 tons of an ozone precursor. IEPA Grp. Exh. 1, Romaine at 16. However, Mr. Romaine stated:

> [USEPA] has granted the states bordering Lake Michigan a NO_x waiver under Section 182(f) of the [CAA]. This waiver is based on scientific analyses that found that controlling NO_x emissions only in the [NAA] would actually increase ozone levels in the area. Instead, for NO_x reductions to improve ozone air quality, they must be provided on a statewide basis and preferably on a multi-state regional basis. IEPA Grp. Exh. 1, Romaine at 16.

Mr. Romaine stated that because of the public concerns regarding the applicability of PSD to peaker plants, IEPA formally sought guidance from USEPA on implementing PSD. He noted that USEPA confirmed that IEPA is properly implementing the applicability provisions of the PSD rules for these plants. IEPA Grp. Exh. 1, Romaine at 17.

b. Nonattainment NSR. Mr Romaine stated that in an area that is designated as nonattainment for a pollutant, PSD does not apply to a proposed project for emissions of the nonattainment pollutant or, in the case of ozone nonattainment, the ozone precursors. He stated that a separate state permit program called MSSCAM or nonattainment NSR (35 Ill. Adm. Code 203) addresses emissions of nonattainment pollutants from a proposed source in the area. IEPA Grp. Exh. 1, Romaine at 14. A proposed project that qualifies as major under the applicability thresholds of MSSCAM must control emissions of the nonattainment pollutant to the LAER, rather than BACT. The project must also provide "offsets" for its emissions.

Mr. Romaine explained that "[o]ffsets are emission reductions that have not been relied upon to demonstrate attainment [and] that have or will occur from existing sources already in the [NAA]." IEPA Grp. Exh. 1, Romaine at 14, n. 4.

Mr. Romaine explained that in the Chicago area, which is designated as severe nonattainment for ozone, a source may be considered major if it has potential to emit 25 tons or more of VOM per year. IEPA Grp. Exh. 2, Romaine, Att. 1 at 2. He noted that NO_x emissions are sometimes regulated as an ozone precursor. However, in the Chicago NAA, NO_x is reviewed under PSD because USEPA has granted a NO_x waiver. (Issues concerning the NO_x waiver are discussed further below.) In the Metro-East/St.Louis area, which is designated as moderate NAA for ozone, Mr. Romaine noted that a source is considered as major if it has potential to emit 100 tons of VOM or NO_x. IEPA Grp. Exh. 2, Romaine, Att. 1 at 2. Further, Mr. Romaine noted that like the PSD program, the applicability of nonattainment NSR is determined on the basis of potential annual emissions, even if a relevant air pollution problem is seasonal in nature, such as ozone pollution that only occurs during summer months. IEPA Grp. Exh. 2, Romaine, Att. 1 at 4.

c. NO_x Waiver. Ms. Kathleen Bassi, Assistant for Program and Policy Coordination for IEPA's Bureau of Air, responded to citizen concerns regarding the NO_x waiver that USEPA granted for the Chicago NAA. In responding to the citizens' position that the waiver should be revoked, Ms. Bassi stated that the removal of the NO_x waiver would have ramifications well beyond the scope of the inquiry proceedings. Tr.2 at 204-205. She noted that NO_x waiver affects all NO_x source in the Chicago NAA and not just peaker plants. In light of this, Ms. Bassi asserted that any decisions on the NO_x waiver should be made by USEPA in the context of its review of the attainment demonstration for the Chicago NAA. Tr.2 at 206. She noted that USEPA would be performing its review of the State's attainment demonstration in the very near future. Tr.2 at 207. Ms. Bassi also clarified that the NO_x waiver does not limit the scope of control measures or reductions that may be required of power plants.

d. NSPS. Mr. Romaine stated that USEPA promulgated NSPS for emissions from new turbines under Section 111 of the CAA, found at 40 C.F.R. 60, Subpart GG. IEPA Grp. Exh. 2, Romaine, Att. 1 at 5. He noted that IEPA implements the federal NSPS in Illinois pursuant a delegation agreement with USEPA. Mr. Romaine explained the applicability of NSPS to gas turbines:

> These standards apply to stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour that commence construction, modification, or reconstruction after October 3, 1977. The limit for NO_x emissions from large turbines, such as those used in peaking power plants, is approximately 75 [ppm]. The exact limit varies by model of turbine because the limit is adjusted for the efficiency of the turbine. Additionally, such turbines may not use any gas that contains [SO_2] in excess of 0.015 percent by volume at

> 15 percent oxygen on a dry basis and sulfur in excess of 0.8 percent by weight. IEPA Grp. Exh. 2, Romaine, Att. 1 at 5.

Versar noted that NSPS also contain monitoring, testing, reporting, and record keeping requirements that the operator of a peaker plant must follow to prove the standards are being attained and the equipment is properly maintained. DuPage County. Bd. Exh. 1 at 28.

Mr. Romaine agreed with the citizens that the NSPS no longer reflects the Best Available Control Technology (BACT) for new equipment. IEPA Grp. Exh. 2, Romaine, Att. 1 at 5. He noted that new natural gas-fired turbines are routinely designed to achieve 25 ppm of NO_x and low sulfur oil that meets the sulfur content limitations is readily available.

e. Hazardous Air Pollutants. Mr. Romaine stated that if a new or reconstructed peaker plant is considered major for emissions of hazardous air pollutants (HAPs), it must undergo review under Section 112(g) of the CAA, which is implemented in Illinois under Section 39.5(19)(e) of the Environmental Protection Act (Act) (415 ILCS 5/39.5(19)(e) (1998)). He noted that a source is considered major for HAPs if it emits 10 TPY or more of any individual HAP or 25 TPY or more of all HAPs aggregated. IEPA Grp. Exh. 1, Romaine, Att. 1 at 5.

Mr. Romaine explained that a new major source of HAP emissions must achieve the maximum degree of reduction that is deemed achievable for new sources in a category or subcategory and may not be less stringent than the emission control achieved in practice by the best controlled similar source, often referred to as the Maximum Achievable Control Technology (MACT). IEPA Grp. Exh. 1, Romaine, Att. 1 at 5. He stated that MACT is implemented on a case-by-case basis during construction permitting until a National Emission Standard for Hazardous Air Pollutant (NESHAP) is promulgated for the relevant source category. Mr. Romaine noted that USEPA intends to develop a NESHAP to address HAPs that stationary combustion turbines emit. IEPA Grp. Exh. 1, Romaine, Att. 1 at 7. He said that USEPA expects to propose this NESHAP, which is likely to address peaker plants, before the end of the year and finalize a standard in 2002. 65 Fed. Reg. 21,363 (April 21, 2000).

Mr. Romaine stated that peaker plants generally are not known to emit more than *de minimis* levels of HAPs. He did note that natural gas-fired combustion units emit formaldehyde, which is listed under Section 112(b)(l) of the CAA. However, emission levels from peaker plants in Illinois have not been great enough to trigger new source analysis under Section 112(g) of the CAA. IEPA Grp. Exh. 1, Romaine, Att. 1 at 5.

f. Title IV Acid Rain Requirements. Mr. Romaine stated that new peaker plants are considered affected sources for acid rain deposition under 42 U.S.C. § 7642(e). He noted that existing units that were operational before the 1990 amendments to the CAA may be entitled to an allocation of SO_2 allowances. However, new sources are required to obtain allowances after January 1, 2000. IEPA Grp. Exh. 1, Romaine, Att. 1 at 5. Some existing peaker plants in Illinois are not considered affected sources for acid rain deposition because they do not serve

generators with a nameplate capacity of more than 25 MW (42 U.S.C. § 7641(8)) and are, therefore, not subject to requirements under Title IV. IEPA Grp. Exh. 1, Romaine, Att. 1 at 6. Mr. Romaine noted that peaker plants must also obtain an acid rain permit from IEPA before starting to operate. These permits are issued in Illinois under the authority of the Clean Air Act Permit Program (CAAPP) at 415 ILCS 5/39.5(17). IEPA Grp. Exh. 1, Romaine, Att. 1 at 6.

g. Operating Permit Requirements. Mr. Romaine stated that because peaker plants are affected sources for acid rain deposition under Title IV of the CAA, they are required to obtain a CAAPP operating permit pursuant to Section 39.5 of the Act. He explained that a peaker plant operator must obtain an acid rain permit before operating. However, the operator must apply for the very detailed CAAPP operating permit one year after starting to operate the facility. IEPA Grp. Exh. 1, Romaine, Att. 1 at 6.

h. State Requirements. In addition to the federal regulations described above, Mr. Romaine stated that peaker plants may be subject to certain State regulations.

i. *PM.* Mr. Romaine stated that the Board's generic regulations that prohibit emissions of visible PM emissions into the atmosphere apply to peaker plants. However, he noted that natural gas-fired peaker plants do not generally emit significant amounts of PM emissions if proper combustion occurs. IEPA Grp. Exh. 1, Romaine, Att. 1 at 6.

ii. *Emissions Reduction Market System (ERMS).* Mr. Romaine stated that if a peaker plant located in the Chicago ozone NAA emits at least 10 tons of VOM during the ozone season (May through September), the plant would be subject to the Emissions Reduction Market System (ERMS) requirements under 35 Ill. Adm. Code 205. He explained the applicability of the ERMS program:

> If the source was operating prior to May 1, 1999, it will be allotted trading units by [IEPA] based on past emissions, with certain adjustments, and will be required to hold sufficient trading units to account for its seasonal emissions each year. If the source was not operating prior to May 1, 1999, it will not be issued trading units by [IEPA] in most instances but will be required to obtain trading units sufficient to account for its seasonal emissions each year. If a new source was issued a construction permit prior to January 1, 1998, it will be allotted trading units by [IEPA] based on its first three years of operation. IEPA Grp. Exh. 1, Romaine, Att. 1 at 6.

Regarding VOM emissions from peaker plants, Versar stated that natural gas is inherently clean burning fuel, and gas-fired turbines generally achieve a level of combustion efficiency to be considered small sources of VOM. DuPage County Board Exh. 1 at 14.

iii. *NO_x Trading Program (NO_x SIP Call) for Electrical Generating Units (EGUs).* In July of this year, IEPA proposed a rule to the Board to reduce statewide emissions of NO_x from electrical generating units (EGUs). As Director Skinner described, "[t]his proposal was in response to [USEPA's] call for [SIPs] requiring significant reductions in emissions or the so called NO_x SIP call, an area in which Illinois, as a state, has been the leader nationwide among the states and has put in a significant amount of work over the course of the past five to 10 years." Tr.1 at 60.

Mr. Romaine discussed the NO_x trading regulations that the Board adopted for first notice at 35 Ill. Adm. Code 217, Subpart W. He stated that the proposed Subpart W is intended to reduce NO_x emissions in Illinois during the ozone season (May - September) from EGUs by determining source allocations and providing for participation in the national NO_x trading program. IEPA Grp. Exh. 1, Romaine, Att. 1 at 7.

Proposed Subpart W applies to fossil fuel- fired stationary boilers, combustion turbines (such as peaker plants) or combined cycle systems that serve generators with a nameplate capacity greater than 25 MW that have at any time produced electricity for sale. Mr. Romaine stated that the new sources that commenced commercial operation on or after January 1, 1995, may receive allowances based on an emission rate and heat input. Initially, these sources may acquire allowances from a new source set aside but eventually will receive allowances from the main trading budget based on when the source commenced commercial operation. Under the proposed rule, NO_x emission reductions will occur beginning in May 2003.[7] IEPA Grp. Exh. 1, Romaine, Att. 1 at 7.

[7] The Board adopted the NO_x trading program rules on December 21, 2000. See Proposed New 35 Ill. Adm. Code 217, Subpart W, The NO_x Trading Program for Electrical Generating Units, and Amendments to 35 Ill. Adm. Code 211 and 217 (December 21, 2000), R01-9. The Board notes that the final rules require sources to begin complying with the trading program in May 2004, instead of May 2003.

3. Information from Industry

Industry representatives testified that Illinois' current air quality statutes and regulations, and additional federal regulations are adequate for regulating peaker plants. Mr. Erjavec of Indeck argued that peaker plants are highly regulated under the Act. Indeck Exh. 1. He asserted that any additional regulations would be unjustified and counterproductive. Ms. Arlene Juracek of ComEd stated that peaker plants are subject to State and federal environmental regulations. Tr.1 at 291-292. She maintained that there is no need for new or stringent regulations. Ms. Juracek argued that additional regulations may have a negative effect on the State's generating capacity. Tr.1 at 293.

Ms. Deirdre Hirner, Executive Director of IERG, testified that the current State and federal air quality standards are adequate for regulating peaker plants. Tr.1 at 310-311. She noted that peaker plants, like any other facility, must comply with regulations, such as NSPS and PSD, if they trigger the applicable regulatory thresholds. Tr.1 at 311. She asserted that even if these plants do not trigger PSD, restrictions like operating limits, monitoring and testing would be placed in the permits to assure that the facility does not exceed the protective upper limit on emissions. Tr.1 at 312. In addition, Ms. Hirner asserted that, because all peaker plants would be subject to the proposed NO_x trading program, fears that additional peaker plants will increase the total tonnage of NO_x in the overall region are unfounded. Tr.1 at 313.

Ms. Freddi Greenberg, Executive Director and General Counsel, Midwest Independent Power Suppliers (MWIPS), also argued that the current regulations are adequate for regulating peaker plants. Tr.1 at 327. She maintained that a strict set of regulations applies to peaker plants, and that these plants do not pose a threat to air quality, human health or the environment. Tr.1 at 327. Mr. Mike Kearney, Manager of Economic Development, Ameren Corporation (Ameren), stated that the current regulations governing the peaker plants are appropriate and provide each stakeholder to an opportunity to become involved in the process. Tr.1 at 341. He maintained that additionally regulating peaker plants is not warranted or needed at present. Mr. John Smith, a representative of the Illinois Section of the American Water Works Association (ISAWWA), also stated that peaker plants should not be singled out and regulated more strictly with regard to air quality. Tr.2 at 24. A similar position was taken by Mr. Brent Gregory, a representative of the Illinois Chapter of the National Association of Water Companies. Tr.2 at 30.

With respect to the NO_x SIP call, Indeck suggested that "natural gas-fired peaking plants should be encouraged rather than discouraged" to help achieve reductions that the NO_x SIP call requires. Indeck noted that gas-fired turbines "are among the lowest emitters of NO_x per kilowatt-hour [kWh] produced, when compared to other means of electrical production." PC 173 at 2.

D. Air Emissions Control Technology

1. Information from Citizens

Ms. Stark of CARE testified that peaker plants were being permitted with inadequate emission control technology. She stated that a peaker plant that Rolls Royce Power Ventures proposed in Lockport was permitted at 55 ppm for NO_x, which will make it the "dirtiest" peaker plant in the State. Tr.1 at 648. Ms. Dorge stated that residents of Illinois and Wisconsin are entitled to air that is as clean as can be achieved with modern technology. Tr.1 at 454. She asserted that peaker plants "should install LAER and every effort should be taken to prevent backsliding particularly in the case of NO_x and VOM emissions." Tr.1 at 454.

Ms. Turnball stated that peaker plants emitting more than 25 TPY should be required to meet BACT. Tr.1 at 926. She noted that Indiana requires BACT for any emitter over 25 TPY. Tr.1 at 925. Further, Ms. Turnball maintained that the treatment goal in the NAA areas should be LAER. Tr.1 at 926. Ms. Cindy Skrukrud, a resident of Olin, Mills, McHenry County, also recommended that peaker plants be required to meet BACT. Tr.1 at 1,024.

Ms. Terry Jacobs, a resident of Libertyville, noted that technology to substantially lower emissions to as low as 4.5 ppm is readily available. Tr.1 at 982. She stated that peaker plants must be required to meet lowest achievable emissions. Tr.1 at 983. Dr. McCarthy submitted information on a specific NO_x control technology called XONON™. McCarthy Exh. 3. He asserted that the XONON™ technology is capable of reducing NO_x emissions to 2.5 ppm. Tr.1 at 1,004. Dr. McCarthy stated that the XONON™ technology is being used by General Electric on 250-MW turbines in Southern California. Tr.1 at 1,005. He urged the Illinois officials to review the XONON™ technology to determine whether it can be used in the State.

Mr. Robert Brooks of Waukegan presented information on power generation technology capable of producing very low NO_x and CO_2 emissions. According to the April 15, 2000 issue of Ward's Engine and Vehicle Technology Update, solid oxide fuel cell turbine engine EGUs—fueled by natural gas and built by Siemens Westinghouse—have 60 to 70% efficiency, produce less than 1 ppm NO_x, require no water, and can be modified so that its CO_2 output is captured for injection into the ground. "The later CO_2-capturing version is planned for demonstration with Shell Oil Co. and is expected to be the first hydrocarbon-fueled generator that can be classified as emitting no CO_2." In the October 1, 2000 issue, the periodical notes that a 220-kilowatt (kW) unit was installed at a California electric utility plant earlier this year and is performing well. A 1,000 kW unit is planned for an EPA facility demonstration in Maryland in 2002. PC 13 at 2.

NRDC stated that combined cycle turbines are capable of obtaining 55-60% efficiencies. Simple cycle natural gas-fired combustion turbines "are considerably less efficient, operating between 28-35% with combustion controls limiting NO_x emissions to 15-25

ppm." PC 109 at 5.

2. Information from State Government

The criteria pollutants from gas turbines targeted for emissions control are NO_x, CO, and VOM. Mr. Romaine of IEPA explained that turbine emissions "can be reduced by combustion modifications and by add-on control devices." Tr.1 at 93. Combustion modifications are the preferred control method for NO_x and CO pollutants from gas turbines. Types of combustion modifications include water injection, air to fuel mix adjustment, and catalytic combustion. Tr.1 at 93-94.

- Injecting water into the burner slows down the combustion process and reduces the formation of NO_x by as much as 60% or more. Tr.1 at 94. NO_x emissions levels for water injection systems range from 42 ppmv for natural gas-fired turbines to 45-75 ppmv for most oil-fired turbines. IEPA Grp. Exh. 2, No. 4 at 5-11, 5-15. However, water injection is not feasible for turbines already achieving emission rates less than 25 ppm through advanced burner design. IEPA Grp. Exh. 1, Romaine at 22. Besides reducing NO_x formation, water injection also increases CO and VOM emissions and decreases fuel efficiency. IEPA Grp. Exh. 1, Romaine at 18.

- Adjusting the air to fuel mix in a "dry low NO_x burner" minimizes "hot spots" in the combustion flame where NO_x is formed and can achieve a reduction in NO_x of 90% or more for natural gas fuel. Tr.1 at 94. For oil, dry low NO_x burners are not as effective. IEPA Grp. Exh. 1, Romaine at 19. For frame turbines, dry low NO_x burners can yield emissions of 9-12 ppm. Aero-derivative turbines will yield about 25 ppm. PC 9 at 22.

- A third type of combustion modification is catalytic combustion known as XONON™ that Mr. Romaine described as a "promising technology for improving burner performance." However, its application is currently limited to turbines much smaller than those proposed for Illinois, around 1.5 MW in size. IEPA Grp. Exh. 1, Romaine at 19.

Mr. Romaine further explained: "add-on control devices are not commonly used for NO_x emissions from simple cycle gas turbines." Tr.1 at 94-95. Although not commonly used, a catalyst material can reduce NO_x to nitrogen and water using ammonia in a chemical reaction known as selective catalytic reduction (SCR). Tr.1 at 95. In a similar process, selective noncatalytic reduction also uses ammonia, but requires higher operating temperatures and no catalyst. IEPA Grp. Exh. 2, No. 4 at 5-87. Using ammonia in these add-on controls presents its own environmental concern because unreacted ammonia may be released into the atmosphere, contributing to acidification of surface waters and soil. Mr. Romaine noted that

none of Illinois' new peaker plants are using or proposing to use SCR. IEPA Grp. Exh. 1, Romaine at 20.

Besides NO_x, add-on control devices are also available for CO and VOM emissions. Because CO and VOM are products of incomplete combustion, add-on control devices use an oxidation catalyst to drive the combustion reaction to completion in the exhaust ductwork without the need for supplemental heat. Tr.1 at 96. These systems generally achieve a 90% reduction, but reduction varies depending on the model of gas turbine. Mr. Romaine noted, "The new peaking plants in Illinois, which rely on good combustion practices to minimize emissions, are not routinely using oxidation catalyst systems." IEPA Grp. Exh. 1, Romaine at 21. A newer add-on control device is the proprietary catalytic technology SCONOX™ for control of NO_x, CO and VOM. However, because SCONOX™ is only effective at temperatures below 700° F, it is not suited for simple cycle gas turbines, which are not equipped with a heat recovery steam generator. IEPA Grp. Exh. 1, Romaine at 21-22.

3. Information from Industry

> Indeck commented on the control technologies that citizens suggested at the hearings:
>
> [T]hese technologies have not been proven on a commercial-sized scale sufficiently that most developers will risk committing to a permit that relies on such unproven technology for compliance. PC 173 at 2.

As to the feasibility of utilizing add-on controls, Indeck noted that although aero-derivative turbines may be more conducive to add-on controls than frame turbines, they generally consume more water, produce more CO, operate less efficiently at high temperatures, and incur additional capital and maintenance costs. PC 173 at 2.

Mr. Ryan of Standard Power and Light provided his company's IEPA air permit application for a peaking facility in West Chicago that would use add-on controls to achieve a NO_x emission rate of 3.5 ppm. Challenging his competitors to reduce their emissions to below 5 ppm NO_x and appealing to the legislature to impose stricter emission standards, Mr. Ryan stated that the new Standard Power and Light peaker plant would be "the lowest emissions source of any peaking power plant in the entire country." Tr.1 at 427-429. Mr. Ryan pointed to available air emissions controls like SCR, SCONOX™, and XONON™. He conceded that the investment may be expensive, but emphasized that, "[r]egardless of what technology is used, something has to be used." Tr.1 at 428. "It's the right thing to do." Tr.1 at 429.

E. Air Quality Modeling

1. Information from Citizens

Individual citizens and citizen groups complained that the air quality modeling that IEPA requires is not accurate and reliable. Tr.1 at 439, 649, 660, 782. Ms. Turnball stated that the air quality modeling should be done using parameters that reflect the actual conditions of humidity, wind pattern, and temperature. Tr.1 at 439-440. She noted that the modeling must show the point of maximum impact for each regulated pollutant. Tr.1 at 440. A number of citizens stated that modeling should be done to evaluate the cumulative effects of all proposed and existing peaker plants and other industrial sources. Tr.1 at 460, 660 and 782. In addition, Ms. Turnball urged the Board to make permanent the air quality modeling requirement that is currently being imposed on peaker plants at the discretion of IEPA Director Skinner. Tr.1 at 513.

2. Information from State Government

a. Function of Air Quality Modeling. As elucidated by Mr. Robert Kaleel, Manager of IEPA's Air Quality Monitoring Unit, "[a]ir quality is predicted through modeling or measured through monitoring. . ." Tr.1 at 109. Models "are applied in an engineering or analytical way to identify the causes of existing problems and in a planning or predictive way to project and avoid future problems." IEPA Grp. Exh. 1, Kaleel at 2. "Modeling provides a quantitative link between sources of air pollutants and ambient air quality. Such a link is necessary when regulatory decisions must be made within the framework of the . . . NAAQS . . . and . . . PSD . . . increments." IEPA Grp. Exh. 1, Kaleel at 3.

To assess potential impacts on air quality, IEPA has been requiring air quality modeling for all peaker plants since at least January 2000. Generally, existing law only requires air quality modeling when a source triggers PSD requirements. Tr.1 at 107. However, as Director Skinner pointed out, IEPA made an administrative change to require modeling for all peaker air permit applications to provide a comprehensive analysis of the potential environmental effects. Tr.1 at 59.

Air quality modeling is a set of mathematical equations relating the release of air pollutants to corresponding concentrations of pollutants in the ambient atmosphere. Modeling is used to identify and evaluate the level of controls required to solve industrial and urban air pollution problems. IEPA Grp. Exh. 1, Kaleel at 2. According to Mr. Kaleel, "[t]here are a number of different types of air quality models that [IEPA] uses for a range of different applications." Tr.1 at 109. The models range in degree of sophistication. The most frequently used simulation model for evaluating the "dispersion of atmospheric contaminants" is the Industrial Source Complex model that USEPA developed. IEPA Grp. Exh. 1, Kaleel at 4. That model:

> [I]s an appropriate model to evaluate local, or neighborhood scale, effects where chemical reactions in the atmosphere are relatively unimportant in determining peak impacts. The [Industrial Source Complex] model was used for air quality impact analyses for those "criteria" pollutants (*i.e.*, pollutants for which

> [USEPA] has established an NAAQS), such as [PM] 10 microns in aerodynamic diameter (PM 10), . . . SO_2 . . . CO . . . NO_2 . . ., where peak impacts from the natural gas-fired peaking plants are expected to be local in scale. IEPA Grp. Exh. 1, Kaleel at 4-5.

The dispersion models are not appropriate for ozone. As Mr. Kaleel explained, "[i]n fact, the ozone modeling techniques that are required are very complex . . . as a result of a complex series of chemical reactions in the atmosphere." Tr.1 at 117. These models are not required of individual applicants. Modeling for ozone uses urban airshed models to address the urban- and regional-scale problem of ozone formation and transport. The ozone modeling that IEPA uses is a photochemical grid model, called the Urban Airshed Model—Version V (UAM-V). IEPA Grp. Exh. 1, Kaleel at 10.

b. Parameters Used in Modeling. IEPA used both dispersion modeling and photochemical modeling to ascertain the potential air quality impacts of the proposed peaker and combined cycle plants.

Dispersion modeling parameters were based on source characteristics (stack location, height, diameter, flow rate, emission rate, exit velocity), wake effects, aerodynamic downwash, and five years of meteorological data. IEPA explained that, "[a]s a result, modeling determines worst-case pollutant concentrations that may result from a proposed plant. * * * However, actual monitoring data . . . are not used to specifically verify the results of dispersion modeling." PC 9 at 26-27.

The parameters used in the photochemical modeling were derived from historic high ozone episodes that occurred in the Lake Michigan region during 1991 and 1995. The parameters used in the ozone air quality modeling were based on meteorological, emissions, and source characteristic data. Meteorological data derived from those high ozone episodes included: wind direction and speed, temperature, pressure, humidity, and turbulence. Data for cloud and precipitation fields were drawn from National Weather Service observations. Data for chemical reactions between pollutants and meteorological conditions was calculated from a numeric algorithm. Emissions data was based on an emissions inventory that includes hourly emissions for volatile organic compounds (VOCs), NO_x, and CO. Sources included in the inventory were: man-made, naturally-occurring (plants and soil), motor vehicles (on-road and off-road), industrial or point (smoke stacks), and area sources (fuel combustion, solvents, *etc*.). As IEPA explained, to determine the worst-case pollutant concentrations that might result from a proposed plant, modeling also included emissions from all new simple cycle and combined cycle plants with active permits or applications. PC 9 at 23-26.

In general, IEPA's photochemical modeling of the peaker plants was based on the future year, attainment modeling of the Lake Michigan Air Directors Consortium. This modeling takes into account growth in each source category as well as air pollution control measures. The control measures include the NO_x SIP call, Enhanced Vehicle Inspection and

Maintenance, Phase II-reformulated gasoline, Tier 2 automotive standards, low sulfur gasoline, heavy-duty vehicle standards, and other measures required by the CAA. IEPA Grp. Exh. 1, Kaleel at 5-6.

c. Results of Air Quality Modeling. In its review of dispersion modeling studies submitted for proposed peaker plants, IEPA found that emissions from these natural gas-fired units are typically small. Of the criteria pollutants that these units are expected to emit, IEPA observed quantities ranging from 40-60 TPY for NO_2, 60-700 TPY for CO, 10-360 TPY for PM 10, 5-250 TPY for SO_2, and 2-130 TPY for VOCs. "From the studies reviewed to date, none of the modeled impacts from these projects have been determined to exceed either the NAAQS or PSD increments for any of the relevant air contaminants." IEPA Grp. Exh. 1, Kaleel at 5-6.

In evaluating the effect of peaker plants on ozone air quality, IEPA relied on results of the photochemical UAM-V model for the attainment year 2007. IEPA Grp. Exh. 1, Kaleel at 10. Results of modeling based on expected reductions from the NO_x SIP call suggest "that the impact of peaker emissions on overall daily maximum ozone levels is small." IEPA Grp. Exh. 1, Kaleel at 12-13. With all peaker plants operating simultaneously on a high ozone day, modeling results suggest that ozone concentrations would increase 1 to 4 parts per billion (ppb). An increase of 1 ppb can be expected in the highest ozone area, which typically occurs over Lake Michigan. Higher impacts are predicted in areas where modeled concentrations are less than the NAAQS. The modeling indicated no change in the Metro-East/St. Louis area. Mr. Kaleel concluded, "[t]he model's response to projected emission increases is small relative to the improvements in ozone air quality achieved to date and to improvements expected in coming years from control programs yet to be implemented." IEPA Grp. Exh. 1, Kaleel at 13-14.

3. Information from Industry

Reliant provided a synopsis of the air quality modeling it performed for its Aurora peaker project in DuPage County. Dispersion modeling included emissions from both its proposed peaker plant plus all other industrial facilities in that area. Reliant concluded that maximum NO_x emissions from the plant would be fifty times less than the NAAQS and found in a small area radiating a few hundred feet to the north of the Reliant property. Reliant concluded that residential neighborhoods one-half mile or more beyond the affected area would register no measurable impact of NO_x emissions on air quality. PC 1 at 3-4.

Indeck also provided information on its air dispersion modeling for NO_x, SO_2, CO, and PM 10 for its proposed Libertyville plant. To predict the worst case effect, modeling was conducted using the five-year worst hourly meteorological conditions and maximum operating rates of 8,760 hours per year rather than the restricted hours in the air construction permit. Indeck suggested that the modeled impacts of the specific pollutants were not significant impacts, either in terms of ambient air standards or in terms of health effects. "In fact, the

predicted ambient air quality impacts from this facility are less than the predicted impacts from a boiler at a typical school and about the same as the impact from one gas heated home." Indeck Exh. 2, Representative Impact Documentation.

F. Air Quality Impacts

1. Information from Citizens

A number of citizens stated that cumulative or combined effect of all existing and proposed peaker plants should be considered in the permitting process. Tr.1 at 460, 980, 1,024. Ms. Terry Jacobs, a resident of Libertyville, noted that the current ability to cluster peaker plants, if permitted by local zoning, does not take into account the cumulative impact. Tr.1 at 980. She stated that the cumulative emissions from peaker plants must be evaluated on a regional level. Tr.1 at 980-981. Dr. McCarthy noted that at present there is no law or regulation for siting multiple peaker plants within close proximity. Tr.1 at 1,010. Ms. Dorge also stated that a number of peaker plants are being sited within close proximity of one another.

CARE's Ms. Stark, stated that peaker plants are being proposed within very close proximity to residences and elementary schools. Tr.1 at 647. She asserted that children's health is not being taken into consideration, especially children with asthma and other respiratory conditions. Tr.1 at 647.

NRDC stated that "[n]atural gas-fired combustion turbines represent the best available large-scale fossil fuel generation in terms of minimal adverse air quality impacts." However, "the aggregate impact of the proposed combustion turbine projects in Illinois would amount to several hundred tons, likely to be emitted during the worst ozone episodes." PC 109 at 5-6.

According to NRDC:

> In isolation single cycle natural-gas fired combustion turbines do not pose a greater threat to public health and the environment than other types of state-regulated facilities, particularly coal-fired steam turbine generating units. However, the aggregate impact of siting several single cycle natural gas-fired combustion turbines should be thoroughly evaluated since these units can emit quantities of NO_x . . . CO . . . PM 10 . . . VOCs . . . SO_2 . . . and sulfuric acid mist . . . in quantities sufficient to trigger permit review thresholds under the [CAA]. * * * [Peaker plants can] also emit toxic air pollutants, including formaldehyde, acetaldehyde, benzene, lead, mercury and beryllium in quantities sufficient to trigger permit review thresholds under the [CAA]. Toxic air pollutants emissions increase significantly at single cycle combustion turbines equipped to burn distillate fuel oils as an alternative fuel source. PC 109 at 6.

2. Information from State Government

a. Impact on Illinois' Ability to Attain the NAAQS. Mr. Kaleel desribed the trends in ozone readings: "Back in the '87 to '89 time frame, the highest design values [for ozone] in

the region were occurring just at the Illinois, Wisconsin border." That reading was 190 ppm of ozone. In Michigan City, the highest reading was 180 ppm. In downtown Chicago, the highest reading was 70 ppm. Tr.1 at 119. In the last three-year period, Northern Illinois has not experienced any violations of the ozone design values. Tr.1 at 120.

Mr. Kaleel recognized "we had a pretty serious problem 10 years ago, and, of course, the IEPA proposed many things, and the Board has acted on many things to reduce precursor emissions over the last 10 years and, through the limitation of those programs and programs required by [USEPA], made tremendous strides." Tr.1 at 120. According to Mr. Kaleel, although "there have been major improvements on ozone[,] [w]e still have a little ways to go. We're still not showing attainment." Tr.1 at 120.

Regarding the impact peaker plants will have on Illinois' ability to attain the NAAQS for ozone, Mr. Kaleel remarked: "So does this result of a peaker complicate our efforts to showing attainment? It clearly complicates our efforts. It would be easier to demonstrate attainment without having synergies." Tr.1 at 129. IEPA is currently preparing its ozone attainment demonstration due in December of this year. Mr. Kaleel believed that Illinois would be able to show attainment with "improvements that are seen from all of the programs that have been implemented to date [because they] far exceed the negative consequences of peaker emissions." Tr.1 at 130. With the modeling to date showing that peaker plants have a noticeable but small effect on ozone concentrations, IEPA expects to be able to demonstrate attainment of the one-hour ozone standard based on the requirements of the NO_x SIP call. PC 9 at 29.

b. Localized Impacts. To ensure that localized impacts are considered, IEPA has required all applicants for peaker plants to perform air quality modeling at the locations where the highest impacts are expected, even as close as the source's fence line. According to IEPA, "[t]he modeling has consistently demonstrated that the air quality impacts of the peaker are small, if not insignificant, and will not cause or contribute to violations of the NAAQS." PC 9 at 6.

3. Information from Industry

Mr. Richard Trzupek is the Air Quality Manger with Huff & Huff, Inc. (Huff & Huff), an environmental consulting firm that assists electric facilities with air permitting. Mr. Trzupek said that "[w]hile coal technology has made massive strides toward becoming a cleaner fuel, it cannot be as clean as natural gas." Huff & Huff Exh. 1 at 13. Comparing emissions from current utility sources to potential emissions if 10,000 MW of coal generating capacity in MAIN were replaced by natural gas, Mr. Trzupek estimated a 27% reduction in NO_x, 29% in SO_2, and 25% in PM. Mr. Trzupek suggested there would be "a significant environmental benefit to the region by substituting natural gas for coal." Huff & Huff Exh. 1 at 7. Mr. Trzupek cautioned that further restrictions on constructing natural gas-fired generation "will have the unintended consequence of making it more difficult for the state to

meet both energy demand and air quality goals." Huff & Huff Exh. 1 at 13.

G. Other Specific Concerns of Citizens

1. Regulating Multiple Peaker Plants with a Single Owner or Operator

Mr. Eaton, attorney for Liberty Prairie Conservancy, Prairie Holdings Corporation, and Prairie Crossing Homeowners Association, stated that some companies were avoiding major source review for individual plants by building multiple plants, each having contaminant levels just under the major source threshold. Tr.1 at 871. He noted that efforts made by a company or business entity having common ownership to obtain permits to construct and operate multiple plants in a vast NO_x airshed constitutes an effort to dilute emissions. Tr.1 at 873. Mr. Eaton asserted that "total emissions from all such plants need to be reviewed as one, not individually, to avoid a circumvention precluded by that regulation." Tr.1 at 873.

2. Environmental Impact Statement (EIS)

Ms. Verana Owen, Co-Chairperson of Zion Against Peaker Plants, stated that the impact of a peaker plant on the environment must be evaluated by conducting an environmental impact statement (EIS). Tr.1 at 943. She noted that an EIS, at a minimum, should address issues concerning hydrology and water quality, water use, water runoff, air quality, loss of habitat, loss of agricultural land, land use, socioeconomic impact, impact on local services including traffic, noise, and public health and safety. Ms. Owen stated that Indiana, Ohio, and Wisconsin require EISs for peaker plants. Tr.1 at 943.[8]

IV. NOISE EMISSIONS

In this part of the Report, the Board summarizes information from the record on (1) citizen concerns about noise emitted from peaker plants, (2) peaker plant noise emissions, (3) methods to control noise, and (4) noise pollution regulation.

A. Concerns of Citizens

Many citizens raised concerns about the potential for peaker plants to cause noise pollution. Individual citizens and citizen groups raised the specific concerns described below.

1. Noise Emissions and Proximity to Residences

- Gas-fired turbines generate significant sound power and can negatively impact nearby

[8] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

property. Sargis Exh. 1 at 7-8.

- Mr. Eaton, on behalf of Prairie Crossing Homeowners Association, Liberty Prairie Conservancy, and Prairie Holdings Corporation, participated in the public hearings held before the Village of Libertyville Plan Commission regarding a 300-MW peaker plant proposed by Indeck. Those proceedings involved more than 20 hearing sessions over 10 months. Mr. Eaton also represented a citizen group in Bartlett with respect to a proposed peaker plant. Tr.1 at 864, 905; Eaton Exh. 1 at 1. Mr. Eaton asserted that, for residents in close proximity to proposed peaker plants, "noise may well be the single most serious and acute environmental problem posed by these plants." Eaton Exh. 1 at 12.

- Mr. Eaton stated that a "number of the approximately 50 pending peaker plant applications for installations are proposed for locations quite close to residences" and many of the residential areas at issue were found to be "extremely quiet." Eaton Exh. 1 at 12, 14.

2. Permitting and Pre-Construction Review

- Illinois has no permit program or pre-construction review for noise emissions. Eaton Exh. 1 at 12; Sargis Exh. 1 at 7-8.

- Mr. Mark Sargis, an attorney with the law firm of Mauck, Bellande & Cheely, has practiced environmental, land use, and zoning law during the past 15 years. He is representing a group of citizens concerned generally about the effects of peaker plants and specifically about a peaker plant proposed in DuPage County near property that the citizens own. Sargis Exh. 1 at 1. Mr. Sargis stated:

> Generally, it is reasonable to expect that, under current regulations, noise emissions from peaker plants would operate closer to or past the point of non-compliance than would air emissions. The fact that there is a comprehensive air permit program, but no required review of noise impacts, indicates an inconsistency in regulation between these two media. Sargis Exh. 1 at 9.

- If noise control is not addressed when designing a peaker plant, adding controls after construction may be ineffective, difficult or impossible, or much more expensive. Sargis Exh. 1 at 7-9.

3. State Noise Standards and Enforcement

- Mr. Eaton asserted that, "even if we had the most rigorous enforcement of current

standards," the State's noise standards are "inadequate":

> [T]he noise regulations are written for 9 octave bands. However, we believe it is fairly well accepted that the nighttime[9] noise regulation limits for emissions from industrial sources to residential receptors can be referred in the shorthand as approximately 51[dB(A), *i.e.*, A-weighted decibels[10]]. That may be fine in a place where these plants perhaps ought to be located, such as existing industrial locations, brownfield areas, or areas where there is already a substantial amount of noise and/or virtually no residences in the vicinity . . . . However, . . . many of these plants have been proposed to be built in or near residential areas. Many of those areas we have found to be extremely quiet. For example, in both Libertyville and Bartlett, background noises, particularly at nighttime and particularly on weekends (when these plants may well operate), are extremely low, running sometimes below 30 [dB, *i.e.*, decibels], and many times in the low 30s in [dB(A)]. Noise doubles approximately every 6 [dB] that the level of sound is increased. Accordingly, to go from 33 [dB] to 39 [dB] would double the noise; to go from 39 [dB] to 45 [dB] would double the noise again; and to go from 45 [dB] to 51 [dB] would double the noise again. Thus, at 51 [dB], noise is eight times as loud as it is at 33 [dB], . . . a fairly common level of noise to be found in or near many of our residential neighborhoods. Eaton Exh. 1 at 13-14.

- Mr. Sargis stated:

> [B]ecause of how the noise regulations in Illinois work, allowing one peaker plant in an area can make it easier for a second, nearby facility to meet applicable noise standards, due to increased ambient noise levels caused by the first facility. This problem is especially apparent because of the areas identified as "preferred" from the standpoint of energy

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[9] Nighttime hours are from 10 pm to 7 am, local time. Daytime hours are from 7 am to 10 pm, local time. See 35 Ill. Adm. Code 900.101.

[10] "A-weighting measurements attempt to compensate for the fact that generally a sound with a given decibel level at a higher frequency seems louder to the human ear than a sound with the same decibel level at a lower frequency. * * * For a given sound measurement, decibels are either subtracted or added at various frequencies using a scale, then the weighted values for each frequency 'are combined to give a single A weighted decibel level for the sound.'" Charter Hall Homeowner's Association v. Overland Transportation System, Inc. (October 1, 1998), PCB 98-81, slip op. at 22 (quoting Noise Pollution Control Regulations (July 31, 1973), R72-2, slip op. at 11).

supply lines. Sargis Exh. 1 at 9.

- There is little, if any, State enforcement of Illinois' noise standards. Eaton Exh. 1 at 12; Sargis Exh. 1 at 9.

- Mr. Eaton asserted:

> [A]t present, there is inadequate IEPA noise enforcement. Illinois' noise regulations are virtually unenforced by IEPA, contrary to the purposes of the Act. Greg Zak, IEPA's noise director, is a one-man noise section and is the only person reviewing this area . . . . [T]here is virtually no ability to enforce these regulation[s], an inability which is due to insufficient staffing and budget restrictions which preclude properly dealing with this critical area. Eaton Exh. 1 at 12.

4. Local Noise Standards and Enforcement

- Local noise regulations are often out-dated or inconsistent with the State standards. Sargis Exh. 1 at 9.

- Local enforcement mechanisms are unlikely to be effective. Sargis Exh. 1 at 9.

B. Peaker Plant Noise Emissions

1. Information from State Government

Mr. Greg Zak is the Noise Advisor for IEPA. He has 28 years of experience measuring noise, controlling noise, and assessing the effects of noise on people. His experience includes industrial, commercial, residential, urban, rural, and construction noise. Tr.1 at 130-131; IEPA Grp. Exh. 1, Zak at 1. Mr. Zak stated:

> Peaker plants pose a greater threat than other types of State regulated facilities with respect to noise pollution because the gas turbine engine used in peakers is one of the most powerful (loudest) noise sources in the U.S. IEPA Grp. Exh. 1, Zak at 3.

He also testified that the noise emissions that must be contained and neutralized in the peaker plant are "tremendous" and that the potential for releasing "great amounts of sound power poses a greater threat than most other types of State regulated facilities." Tr.1 at 132.

Mr. Zak, referring to the Board's noise regulations, stated that noise emissions from peaker plants may be characterized as "nuisance noise (35 Ill. Adm. Code 900.102),

broadband noise (35 Ill. Adm. Code 901.102(b)), and tonal noise (35 Ill. Adm. Code 901.106)." IEPA Grp. Exh. 1, Zak at 3. He stated that "very low frequency (rumble) noise" is associated with large gas turbines. IEPA Grp. Exh. 1, Zak at 4. He added that uncontrolled peaker plant noise emissions may significantly depress neighboring property values. Tr.1 at 136.

Mr. Zak stated that IEPA has received no noise complaints regarding existing peaker plants. However, "with the new influx of permit applications and peakers coming on-line, we're keeping an eye on that to see if we do have a . . . problem." Tr.1 at 170; IEPA Grp. Exh. 1, Zak at 6. He stated that peaker plant noise emissions can greatly exceed the limits that the Board requires in 35 Ill. Adm. Code 900.102, 901.102(b), and 901.106. IEPA Grp. Exh. 1, Zak at 3. These exceedences can occur if the noise emissions are not controlled in the peaker plant housing, or the land buffer or setback needed is not considered when choosing a site. IEPA Grp. Exh. 1, Zak at 3.

2. Information from Local Government

The DuPage County Department of Development and Environmnetal Concerns retained Versar, an environmental consultant, to review environmental issues related to peaker plants. DuPage County Board Exh. 1 at 1. Versar stated that peaker plant noise may be a concern. It explained that combustion turbines are "very similar to the technology of jet air craft engines, and some, but not all, of the combustion turbines used in peaker plants are derived from aircraft designs." DuPage County Board Exh. 1 at 16. Versar cautioned, however, that there are limits to comparing peaker turbines and jet aircraft engines:

> This can lead to inappropriate comparisons between peaker plants and aircraft noise, which are generally not true. A jet aircraft engine provides power by exhausting a high-velocity gas stream for propulsion, and capturing only enough energy from the exhaust to compress inlet air. A ground-based turbine, such as a peaker plant, extracts much more energy from the exhaust to perform the mechanical work of generating electricity. A peaker plant will also have much larger inlet and outlet structures, that will reduce noise both indirectly and by design. DuPage County Board Exh. 1 at 16.

Nevertheless, Versar noted that the "residual noise from the turbine train may be significant to surrounding residential, commercial and industrial neighbors, and a peaker plant may have other components that can generate noise." DuPage County Board Exh. 1 at 16. Versar identified the following potential noise sources at peaker plants:

- Air inlet structures;

- Combustion turbine casings;

- Air exhaust from stacks;
- Fans from exhaust vents;
- Auxiliary compressors, pumps, and other equipment;
- Transformers; and
- Cooling towers. DuPage County Board Exh. 1 at 17.

Versar noted that impulsive sounds, which are "generally associated with activities that are intermittent, usually with a duration of one second or less, such as drop forging or blasting, . . . would not generally be anticipated to be located at a peaker plant . . . ." DuPage County Board Exh. 1 at 35.

Versar provided information on six proposed peaker plants, five in Illinois and one in Maryland:

Developer	Location	Size (MW)	Noise Analysis Results
Indeck	Libertyville	300	• From modeling, facility will produce 47-51 dB(A) at nearby residences (1,200 feet), 41-45 dB(A) at 2,400 feet • Existing noise is higher with 43-61 dB(A) in residential and 57-69 dB(A) in commercial areas
Reliant	Aurora	950	• From modeling, facility will produce 55-57 dB(A) at nearest residential receptors, 60 dB(A) at nearest commercial receptors • Plant is expected to operate only during the day
Constellation	West Chicago	300	• From modeling, facility will not meet Board noise standards without noise suppression

			• Applicant committed to install noise suppression to meet the standards • No quantitative data
Reliant	Cecil County, Maryland	1,125	• From modeling, facility will produce 58-64 dB(A) • Existing daytime noise measured at 38-59 dB(A) • Plant is expected to operate only during the day
Dynergy	East Dundee	398	• No pre-approval analysis identified • Most recent Village resolution (for expansion to 398 MW) required the developer to fund noise measurements to verify that the constructed project complies with Illinois and Village noise requirements
Reliant	Shelby County	328	• Applicant stated that plant would meet 70 dB (represented as the "county standard," but not further explained) at the property boundary • Applicant stated that the plant would meet 61 dB(A) (represented as the "state standard") at the property boundary and emit 55-56 dB(A) at the nearest residence

DuPage County Board Exh. 1 at 17-18.

3. Information from Industry

Indeck's Mr. Erjavec asserted that the lack of any noise complaints to IEPA about any of the approximately 100 peaker plants in Illinois supports the proposition that peaker plants do not pose a unique threat, or a greater threat than other types of State-regulated facilities, with respect to noise pollution. Tr.1 at 241; Indeck Exh. 1, 2. He added that when the McHenry County Board toured a peaker plant operated by the local utility in Springfield, one of the county board members standing 1,500 feet from the peaker plant said: "We didn't hear anything. The corn was louder than the plant." Tr.1 at 24; Indeck Exh. 2, PowerPoint. Mr. Erjavec offered further anecdotal evidence that residents near peaker plants find the plants to be quiet. Tr.1 at 241-242; Indeck Exh. 2, PowerPoint.

An independent environmental assessment report on Indeck's proposed 300-MW facility in Libertyville concluded that the proposed facility, with careful design, should be able to meet the Board's nighttime numeric standards. Indeck Exh. 2, ERM report at 36, 38. Indeck's consultant, Acentech, Inc. (Acentech), identified the major noise sources at the proposed facility:

- Combustion turbine/generators (noise radiated from the air inlet, exhaust, and casing);
- Transformers;
- Cooler fans;
- Equipment (*e.g.*, combustion turbine compartment) and building ventilation systems—in-line or rooftop exhaust fans and fresh air inlet openings; and
- Miscellaneous equipment (*e.g.*, motors, pumps, air compressors, and fuel gas flow valves, regulators, and heaters). Indeck Exh. 2, Representative Impact Documentation, App. 2.0 at 7-8.

4. Information from Citizens

Midwest Environmental Assistance Center (MEAC), a consultant, performed noise analyses for several groups (including a homeowners association) concerned about Indeck's proposed peaker plant in Libertyville. MEAC conducted noise monitoring at several locations in Libertyville and Grayslake to determine area background noise levels:

> The results of that monitoring . . . show background nighttime sound levels in Prairie Crossing as low as 35 dB(A) on weekdays and as low as 33 dB(A) on weekends, and daytime background levels on weekends also ranging as low as 35 dB(A), levels typical of quiet suburban environments with little industrial activity.

> Octave band background sound level measurements for residential areas near the proposed Indeck plant site show background noise levels in the lowest regulated frequencies (31.5-125 [Hertz]) as low as 35-40 dB during both daytime and nighttime hours. These levels are more than 30 [dB] below [State] nighttime noise regulation limits of 69 dB, 67 dB and 62 dB for these frequency bands. A 30 dB increase would increase by over 30 times the low frequency background sound found in this area. Readings in other octave bands, although less pronounced are nevertheless also very significant. PC 6, MEAC report at 1.

Based on its monitoring data and its review of Acentech's noise studies on the proposed peaker plant, MEAC concluded:

> [I]t is anticipated that noise from the proposed Indeck plant would totally replace the existing background sound climate in areas including portions of Prairie Crossing, Bull Creek and Harris Road residential areas, during weekend daytime and nighttime hours, and would be the major contributor to the noise climate during weekday nighttime hours.
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> The existing, characteristic quiet suburban residential nighttime and weekend daytime background sound conditions will be replaced by the steady noise source propagations of the proposed 300 MW turbine generator peaker plant.
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> If the noise levels predicted were only 5 to 10 dB over the existing background sound level at Prairie Crossing, Bull Creek or the nearest Libertyville resident, then some moderate noise abatement procedures might possibly create a reasonable new noise condition. But when the existing background sound levels are to be violated by 15, 20 or 25 to 30 dB at various octave band frequencies, even the casual observer is bound to conclude that this type of large industrial facility belongs in [an] . . . industrial area . . . . PC 6, MEAC report at 1, 10, 12.

C. Noise Control Methods

1. Information from State Government

Mr. Zak of IEPA testified that primarily four strategies are used to control noise emissions from peaker plants: air intake silencers; turbine enclosures; air exhaust silencers; and setbacks. First, properly designed and installed combustion air intake silencers reduce intake noise by approximately 99.999 to 99.99999% in the average peaker plant. Second, a

hardened acoustic enclosure completely containing the gas turbine similarly controls noise radiated from the turbine's outer shell. Third, properly designed and installed combustion gas exhaust silencers reduce exhaust noise by approximately 99.9999 to 99.999999%. Tr.1 at 132-134; IEPA Grp. Exh. 1, Zak at 3-4.

The fourth noise control strategy is a setback or land buffer. Mr. Zak explained that the size of the setback should correspond to the distance needed to ensure that noise emitted from the peaker plant will have dissipated so as to meet State standards at the peaker plant's property line. He added, therefore, that the setback distance needed would depend upon the level of noise control included in the peaker plant's initial design. Mr. Zak explained that the peaker plant should control the setback land to eliminate the concern of residential development moving in next to the peaker plant. Tr.1 at 133-134; IEPA Grp. Exh. 1, Zak at 4.

Mr. Zak also testified about a new noise control technology called "active noise cancellation." Tr.1 at 133. This technology has the potential to abate "much of the very low frequency, rumble type sound associated with large gas turbines . . . ." However, the technology is "unproven . . . when used in low cost applications." Tr.1 at 133. He added that active noise cancellation could be considered "when the more traditional silencer technology is not able to satisfactorily address the rumble problem." Tr.1 at 133-134.

2. Information from Local Government

In its report prepared for the DuPage County Department of Development and Environmnetal Concerns, Versar indicated that peaker plant noise usually can and must be accounted for in designing the project. Means of noise control include buffer zones, inlet and outlet silencers, noise-reducing housings for the turbines and other mechanical equipment, low-speed fans, structural barriers, and prohibiting nighttime operation. DuPage County Board Exh. 1 at 16-17.

The Lake County Board's legislative program for the 2000 session of the Illinois General Assembly provides that the county board would seek to directly sponsor legislation that would have the State establish a siting process, similar to the current landfill siting process, that would review noise emissions from peaker plants among other factors. Lake County Exh. 5 at 8.

3. Information from Industry

Mr. Erjavec of Indeck stated that because peaker plants may be called upon to operate at any time and because sound attenuation cannot be increased at night, peaker plants are designed to meet the Board's nighttime numeric noise standards at all times. Tr.1 at 240-241. He added that peaker plants are meeting Illinois noise standards through buffer zones or designed noise silencing measures. Tr.1 at 242; Indeck Exh. 1, 2. Noise silencing measures

include mufflers and enclosures of turbine areas. The enclosures are made of acoustical material. Tr.1 at 266.

Mr. Erjavec testified that if a peaker plant has a large buffer zone, the plant "may not need to put quite as much acoustical treatment onto [the] facility." Tr.1 at 268. Likewise, engineered noise controls may eliminate the need for a large buffer zone. Tr.1 at 268. Mr. Greg Wassilkowsky, another Manager of Business Development for Indeck, testified that the University of Illinois has gas turbines located across the street from a hospital. Tr.1 at 268-269.

Indeck budgeted approximately six to eight million dollars for acoustical treatment on its proposed 300-MW peaker plant in Libertyville. Tr.1 at 269; Indeck Exh. 2, ERM report at 38. Indeck's consultant, Acentech, identified the major noise sources at the proposed facility and the corresponding noise control measures proposed:

Noise Source	Noise Control Measure
Combustion turbine/generators (noise radiated from the air inlet, exhaust, and casing)	• Air inlet noise—parallel-baffle muffler in the inlet ductwork to each unit; acoustically-lined inlet duct or lined inlet plenum • Turbine exhaust noise—contain in the ductwork by thermal/acoustical lagging or enclosures; reduce as it travels through the exhaust flow path by a muffler typically located in the ductwork between the turbine and the stack or within the stack • Casing-radiated noise and noise from ancillary equipment—enclose in acoustical structure
Transformers	• High-efficiency transformers designed to have lower internal magnetic flux densities and lower magnetostrictive forces • Acoustical barrier walls or partial or full enclosures around transformers
Cooler fans	• Specify reduced-speed, low-noise fans • Locate units to take advantage of shielding that other structures provide

	• Barrier walls near the units
Equipment (*e.g.*, combustion turbine compartment) and building ventilation systems—in-line or rooftop exhaust fans and fresh air inlet openings	• Lower-speed, reduced-noise fans • Mufflers or acoustical lining in the air paths • Locate units to take advantage of shielding that other structures provide • Barrier walls near the unit

Miscellaneous equipment (*e.g.*, motors, pumps, air compressors, and fuel gas flow valves, regulators, and heaters)	• Specify noise limits • Install inside facility buildings or in smaller, acoustically-designed enclosures or lagging

Indeck Exh. 2, Representative Impact Documentation, App. 2.0 at 7-8.

Independent consultants for Libertyville stated that Indeck proposed a "serious design effort to mitigate potential noise impact" and that a typical noise control budget for that type of facility is two million dollars. Indeck Exh. 2, ERM report at 38. The independent consultants concluded that public concerns over Indeck's proposed noise control measures were not warranted:

> While it is true that low frequency noise is more difficult to mitigate than high-frequency noise, that doesn't mean that it can't be controlled at all. For example, a reasonably substantial building envelope can contain much of the equipment noise inside the building, and barriers can provide a noise reduction of at least five [dB] at any frequency, provided they block the line of site between the noise source and receiver. In addition, silencers such as [Indeck's] planned 80-ft long exhaust silencer can provide substantial noise reductions, even at low frequencies. Indeck Exh. 2, ERM report at 38.

D. Noise Pollution Regulation

1. Pre-Construction Permitting or Review

a. Information from State Government. Mr. Zak of IEPA stated that to avoid problems with peaker plant noise, "compliance reviews (on paper) are essential to insure future compliance" with the Board's noise regulations. IEPA Grp. Exh. 1, Zak at 5. He stated that turbine manufacturers could provide a substantial amount of noise information. IEPA Grp. Exh. 1, Zak at 6. He added that "before full operation is started, the peaker should show that

it can be operated at or below the nighttime noise limits (35 Ill. Adm. Code 901.102(b))." IEPA Grp. Exh. 1, Zak at 5. Mr. Zak stated that "if a peaker plant could not show compliance through a demonstration, the problems could be resolved at the beginning." IEPA Grp. Exh. 1, Zak at 5. He also testified that "the design and noise compliance review of that design are the most important project events." Tr.1 at 135. Illinois regulations do not require noise permits or any pre-construction design review for compliance with the numeric noise standards. Tr.2 at 239; IEPA Grp. Exh. 1, Zak at 5-6; IEPA Grp. Exh. 2, Att. 20.

Mr. Zak testified that "[d]esigning and adding on noise compliance after the plant is built may be next to impossible." Tr.1 at 135. He explained that "[u]pgrading costs would be extremely high, if not prohibitive, for added noise control." IEPA Grp. Exh. 1, Zak at 6. He noted that incorporating noise control measures during the design stage of a peaker plant is much less expensive than adding those measures after the plant is operational. Tr.1 at 137. Because "[s]ilencing equipment comprises the bulk of the peaker plant and is carefully tuned to match the turbine," in some instances "it may be less expensive to install a whole new unit than try to upgrade the old one." IEPA Grp. Exh. 1, Zak at 6.

IEPA stated that for several years it has had an "internal mechanism for insuring a demonstration of compliance with numeric noise standards" as part of the land permit application process for gas turbines used to generate electricity from landfills. PC 9 at 34. IEPA also stated that its air construction permit application does not require noise pollution information. IEPA added:

> Assuming adequate funding and personnel (neither of which exist today), if information addressing noise pollution were submitted with air construction permit applications, [IEPA] could coordinate the permit review process by routing the noise portion of the air permit application to the appropriate personnel. PC 9 at 34.

b. Information from Local Government. Developers of peaker plants often have noise modeling performed before construction to assess potential peaker plant noise against applicable noise standards. The noise analyses can involve a complex evaluation of current and proposed noise sources, noise control measures, and neighboring land uses. DuPage County Board Exh. 1 at 17-18. Versar, the consultant for DuPage County, cautioned however that existing noise regulations "limit actual noise impacts from facilities once they are constructed . . . ." "Before-the-fact analyses" might be requested as part of the zoning application process, but they are not "automatically required." DuPage County Board Exh. 1 at 44.

Five of the six peaker projects that Versar reviewed for the DuPage County Department of Development and Environmental Concerns, including four projects in Illinois and one in Maryland, provided "pre-approval noise analysis . . . with supporting material for either the state air permit or a specific local approval." DuPage County Board Exh. 1 at 44. However,

Versar noted that the methodologies and level of detail in proposing noise control measures varied considerably among the studies. DuPage County Board Exh. 1 at 44.

Versar stated that DuPage County may wish to consider:

> [R]equiring applicants to conduct noise analyses and/or fund analyses to be conducted by the County, either as part of its Conditional Use approval process for electric power generating stations or on an ad hoc basis with individual applicants, assuming that sufficient authority exists in current ordinances. DuPage County Board Exh. 1 at 45.

Mr. Paul Hoss, Zoning Manager with the DuPage County Department of Development and Environmental Concerns, stated that DuPage County is considering amending its zoning ordinance and standards because of concerns over peaker plants and similar industries. Specifically, DuPage County is considering requiring these petitioners seeking conditional or special use approval to "submit a noise-modeling study, which indicates that the facility will be in compliance with DuPage County noise requirements" and to use "noise controls sufficient to meet county noise requirements." DuPage County Board Exh. 3 at 4. Mr. Hoss elaborated:

> Requiring the petitioner to submit noise modeling before and as part of the special use process and before any permits are issued. This is a similar type process I understand that the developer of peaker plants has to go through for air emissions, submitting . . . air modeling so that the IEPA can review what the impacts—potential impacts could be. We're proposing to do a similar type modeling with respect to noise to ensure or to, at least, glean some information as to whether or not these facilities will comply at least in the model with county noise ordinances.
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> [E]ssentially what we would be looking for is to have them show that the peaker plant operating at full capacity would meet the county noise standards for nighttime and daytime at the property line and we would want to make sure that their model shows that, in fact, it would meet that requirement. Tr.1 at 400-401, 406.

Mr. Hoss explained that DuPage County would need to retain a professional consultant to review noise studies because the county staff lacks the expertise to assess them. Tr.1 at 413-414.

Versar also expressed concern over how facilities modeled to show compliance with daytime but not nighttime standards would be restricted to daytime operations:

> [T]he noise analysis for Reliant facilities in Aurora, IL and Cecil County, MD indicate noise levels in compliance with daytime limits, but not with applicable nighttime standards. This is apparently considered not to be a problem because the plants will operate during daytime peaks. However, it is not clear how the plants may be restricted from nighttime operations that would apparently exceed allowable levels.
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> Each analysis [for the five projects] indicated that the respective project would comply with state and local noise limits during daytime. Results for only one project indicated compliance with nighttime levels based on reported analysis, and that was for residences at a considerable distance, not at property boundaries. Project sponsors may be focusing on daytime operations as the most likely scenario, but it was not apparent that nighttime operations would be precluded. DuPage County Board Exh. 1 at 17, 44.

c. Information from Industry. Mr. Erjavec of Indeck testified that peaker plant designs account for Illinois noise regulations because the plants must comply with the regulations even though noise compliance is not part of the permitting process. Tr.1 at 283.

When Indeck proposed a 300-MW peaker plant in Libertyville, Indeck guaranteed that it would "limit noise from [its] facility to levels that are 2 [dB] below the applicable Illinois nighttime regulation [at each octave band for sound emitted from Class C to Class A land] at the nearest residence, located 1,200 feet northwest of the proposed site." Indeck Exh. 2, ERM report at 35, 57, Representative Impact Documentation. Indeck's consultant, Acentech, predicted the noise levels from the proposed plant based measurements of existing ambient noise and on "vendor and Acentech octave-band data for the major plant noise sources, and on estimates of sound attenuation (loss) with distance that considered geometrical spreading of sound [based on the standard sound propagation model for hemispherical spreading from a point source] as well as some atmospheric absorption of sound [at higher frequencies (1,000 hertz and above)]." Indeck Exh. 2, ERM report at 36-37, 56, Representative Impact Documentation. For the Libertyville proceeding, Acentech provided noise impact predictions, but not evidence of actual measured results from a similar facility. Indeck Exh. 2, ERM report at 57.

MEAC, a consultant for several groups, including a homeowners association, raised concerns about Acentech's predictions. Indeck Exh. 2, ERM report at 35-36. Independent consultants for Libertyville concluded the following about the predictions of Indeck's consultant:

> While it is true that noise levels can increase under downwind or temperature inversion conditions, this increase is largely due to the reduction or elimination

> of sound attenuation due to ground absorption, foliage or shielding by barriers. Because [Indeck's consultant's] estimates do not include any of these effects, we believe that their predictions fairly represent "worst case" sound propagation conditions. Beyond that, however, there appears to be little margin of safety in [Indeck's consultant's] estimates to achieve the noise limits guaranteed by Indeck. Thus, while we believe that Indeck can meet [its] noise guarantee, we also believe that this will not be easy and will require careful design. Indeck Exh. 2, ERM report at 36.

The independent consultants recommended that a Libertyville permit require Indeck to pay for an acoustical engineer to conduct "a noise compliance test on behalf of [Libertyville] to ensure that all noise limits are met prior to allowing the facility to initially go 'online' (revenue operation)." Indeck Exh. 2, ERM report at 39. The consultants also recommended that Libertyville require that similar compliance tests be performed annually "after the start of operation to ensure that the repeated start-up and shut-down of the peaking plant has not affected the performance of the acoustical treatments." Indeck Exh. 2, ERM report at 39.

d. Information from Citizens. Mr. Mark Sargis, an attorney representing a group of DuPage County citizens concerned about the effects of peaker plants, emphasized the importance of considering noise concerns during design and not relying solely on enforcement:

> [T]he reality is that noise control is best addressed in the design phase of a facility, because it is difficult if not impossible to retrofit such equipment after construction to correct noise violations. In addition, it is important to accurately and correctly measure ambient noise before a facility goes on-line. Furthermore, public policy is better served by encouraging appropriate design before construction, rather than rely on enforcement mechanisms for violation that are, at best, uncertain and, at worst, ineffective.
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> At a minimum, the Board and [IEPA] should consider policy and/or regulations that would require an applicant for certain types of large facilities, including peaker plants, to submit detailed information about ambient noise and projected noise emissions as part of the review of a construction or development permit. In this way, concerns about noise impact on nearby property can be more effectively addressed in the design phase of a facility, rather than leading to noise complaints after construction, at which time additional controls may be difficult, ineffective, or much more expensive.
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> Although [reviewing noise impacts during design] may require some minimal

> additional [IEPA] personnel, the incremental cost seems a small price to pay to address what is becoming a significant issue, particularly for peaker plants. Sargis Exh. 1 at 7-9.

Mr. Sargis also provided his views on the legal authority for requiring noise analyses as part of the permitting process:

> On occasion, [IEPA] has reviewed projected noise emissions for individual projects on a case-by-case basis in the context of other permit programs in the Bureaus of Land and Air. Despite this practice, it is my understanding that the Air Bureau, for example, will no longer consider noise emissions in the context of air permit applications. I agree that examination of noise issues should not be conducted on an *ad hoc* basis. However, there is clear authority for Illinois to consider noise emissions in any permit proceeding, and it makes sense to do so for facilities such as peaker plants that have potentially significant noise impacts.
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> Section 39 of the . . . Act states that "it is the duty of [IEPA] to issue . . . a permit upon proof by the applicant that the facility, equipment, [etc.] will not cause a violation of [the] Act or of regulations hereunder." 415 ILCS 5/39. Under that authority, [IEPA] should not issue a permit, even an air permit, if there is a question of whether that facility would violate applicable standards for other media, including noise.[11] In other words, [IEPA] need not necessarily establish a separate permit program for noise emissions to be able to fulfill its statutory duty under the act. The State *could*, however, implement a permit program for certain categories of facilities with reasonable application fees that would help fund the program. Sargis Exh. 1 at 8.

Mr. Eaton, an attorney representing several groups (including a homeowners association) concerned with peaker plants, stated that the failure to assess noise emissions as part of IEPA's permitting process is a "problem that needs to be rectified, either by including noise as a part of [the existing] permitting process, or requiring a separate noise permit for new installations." Eaton Exh. 1 at 12.

2. Illinois' Current Noise Regulations

a. Information from State Government. IEPA stated that it is unaware of any concerns with peaker plant noise emissions that warrant changing the Board's current numeric noise standards. IEPA accordingly found no merit in changing the requirements so that the more

[11] Citing to Section 39(a) of the Act, Director Skinner stated that one of the important objectives of IEPA is to ensure that "[n]o permit shall be issued for the construction of a peaker plant unless the permit applicant proves that the facility will not violate existing environmental laws and regulations." IEPA Grp. Exh. 1, Skinner at 2-3.

stringent nighttime numeric standards apply all weekend, for example. IEPA emphasized that local units of government can impose more stringent noise requirements as appropriate for the respective communities. PC 9 at 33-34. IEPA also noted that the Board's numeric standards already account for background noise, *i.e.*, ambient noise. PC 9 at 33 (citing 35 Ill. Adm. Code 900.103(b), which requires that measurements and measurement procedures "correct or provide for the correction of such emissions for the presence of ambient noise . . . .").

Mr. Zak did state that the Board's numeric noise standards do not address low frequency noise or vibrations (infrasonic sound) that could be associated with peaker plants. He explained that the lowest frequency in the Board's numeric noise standards is 31.5 hertz; "infrasonics typically occur below 20 hertz." Tr.1 at 199. IEPA stated, however, that the "issue of low frequency noise, specifically infrasonics, (*i.e.*, vibrations) does not lend itself to a numerical standard at this time." PC 9 at 33.

Mr. Zak suggested that if a peaker plant emitted this low frequency sound, and it became a problem for residents, the residents could bring an enforcement action before the Board alleging nuisance noise. Nuisance noise allegations could be corroborated with measurements. Mr. Zak concluded that, for enforcement and health purposes, Illinois' current noise regulations are adequate to address any noise problems that peaker plants may create because those regulations include not only numeric standards, but also the nuisance noise prohibition. Tr.1 at 198-200; Tr.2 at 238-239; PC 9 at 33 (citing the nuisance noise prohibition at 35 Ill. Adm. Code 900.102).

b. Information from Local Government. Versar, the consultant for DuPage County, concluded that the State's numeric noise standards are "quite stringent" and "appear to be an ample basis for ensuring acceptable environmental impacts from peaker plants." DuPage County Board Exh. 1 at 45. Versar also referred to peaker plant applicant Reliant's assessment of the stringency of Illinois' standards: "allowable impacts to residential land would be on the order of a residential air conditioner at a distance of 15 feet." DuPage County Board Exh. 1 at 44.

c. Information from Citizens. Mr. Eaton asserted that the State's noise standards "need to be revisited, and new emission levels consistent with background noise levels in quiet residential neighborhoods need to be taken into account." Eaton Exh. 1 at 14. Mr. Eaton acknowledged that it may be "impracticable for these [peaker] plants to meet noise levels in the low 30s." He asserted, however, that if that is the case, the plants "simply should not be built in locations where they will be disturbing people." Eaton Exh. 1 at 14. He concluded:

> These and other new facilities need either to be required to comply with far more stringent noise requirements than the present regulations require, or to find a location where they can comply with those regulations, where background noise levels are not so extremely low as is the case with a number of these proposed sites. Eaton Exh. 1 at 14.

3. Enforcement of Illinois Noise Regulations

a. Information from State Government. Presently, the State does not enforce Illinois noise regulations. Instead, IEPA provides technical assistance to persons who wish to bring enforcement actions. Individual citizens as well as local authorities may bring actions before the Board to enforce Illinois' noise regulations. Tr.2 at 238-239; IEPA Grp. Exh. 2, Att. 20.

b. Information from Local Government. Mr. Hoss of the DuPage County Department of Development and Environmental Concerns testified about how DuPage County would address a facility causing a noise problem:

> What we currently do, for instance, if a peaker plant were operating and there were a noise problem, we would hire . . . a noise expert to determine if they were in violation. If they were, we would actually file a complaint with the . . . Board on that violation and prosecute it in that manner. Tr.1 at 407.

Versar, DuPage County's consultant, cautioned however that "[w]ith the exception of East Dundee, where applicant funding for post-construction noise monitoring was required, it is not now clear what resources would be available to analyze or enforce compliance." DuPage County Board Exh. 1 at 45.

c. Information from Citizens. Mr. Eaton described the lack of any State enforcement of its own noise standards as an "intolerable state of affairs . . . due to a lack of manpower." Eaton Exh. 1 at 13. He urged that, "[a]t a minimum, having the IEPA check sources for noise, and having IEPA regulate noise emissions by enforcing their standards through a permit process that has some teeth in it, would be a major step forward." Eaton Exh. 1 at 13.

4. Noise Regulation in Other Jurisdictions

a. Information from State Government. Mr. Zak's review for noise regulations in other states revealed that 43 states lack noise regulation, six states have very little noise regulation, and Illinois is "more active than the others in regulating noise." Tr.1 at 135; IEPA Grp. Exh. 1, Zak at 5; IEPA Grp. Exh. 2, No. 19. Mr. Zak stated that "[p]eaker noise is not regulated by the other [USEPA] Region 5 states [*i.e.*, Indiana, Michigan, Minnesota, Ohio, Wisconsin], California, Texas, or New York." IEPA Grp. Exh. 1, Zak at 5. Mr. Zak cautioned, however, that local governments in these states may regulate noise by ordinance. Tr.1 at 135. He added that "peaker noise is not regulated on the federal level." Tr.1 at 136.

Mr. Zak testified that local governments might be reluctant to adopt stringent noise standards for peaker plants:

> I think the reluctance on some of the local government, though, is the cost of the personnel and the instrumentation in order to enforce that type of noise regulation . . . . [T]he instrumentation is expensive and typically the salaries are also expensive for the folks that can take those kind of measurements and enforce those kinds of regulations. Tr.1 at171.

b. Information from Local Government. The Versar report, prepared for the DuPage County Department of Development and Environmental Concerns, compared the noise standards of DuPage County with those of the State:

> [T]he allowable daytime and nighttime sound impacts on residential property compare completely. For business property, the County allowable sound levels make no distinction between the land designations for the source of the sound and are only equivalent to the impact levels on Class C Land. Thus, the business and residential property allowable sound levels are less stringent than the State's. The impulsive limits set by the State are slightly more stringent than the County limits, which also make no distinction between the land designation for origination of the sound. DuPage County Board Exh. 1 at 35.

Because of concerns over peaker plants and similar industries, DuPage County is considering replacing its noise standards for all property uses with the State standards. Tr.1 at 398, 407; DuPage County Board Exh. 3 at 3.

DuPage County is also considering requiring that the facility's "operational area" be "at least 1,000 feet from all parcel boundary lines that adjoin any zoning district." DuPage County Board Exh. 3 at 4. DuPage County would define "operational area" as "all facilities used to generate the services (i.e.: towers, cooling equipment, exhaust or venting equipment and structures housing such equipment)" and exclude items, such as wires and pipes, used to transport the power off-site. DuPage County Board Exh. 3 at 4; Tr.1 at 401. In addition, Versar noted that the DuPage County ordinance lacks any provision "to oversee enforcement of the noise limits, except based on noise complaints." DuPage County Board Exh. 1 at 35.

The Versar report refers to Maryland residential noise standards of 65 dB(A) for daytime and 55 dB(A) for nighttime. The same report refers to the Village of East Dundee passing a resolution requiring a peaker plant developer to fund post-construction noise measurements to verify that the plant complies with Illinois and village noise requirements. The Versar report also identifies a noise standard of "70 dB (not further defined)" for Shelby County. DuPage County Board Exh. 1 at 18.

c. Information from Industry. A group of independent consultants prepared a report for Libertyville, assessing the anticipated environmental impact from Indeck's proposed 300-MW peaker plant. The report described several local noise ordinances. Libertyville's zoning code has a noise performance standard that "prohibits a facility from producing noise that is

detectable at any location beyond the facility's lot." Indeck Exh. 2, ERM report at 35. Libertyville's consultants concluded that Libertyville's noise standard "is not realistic, since audibility is rarely, if ever, used as a criterion for noise acceptability." Indeck Exh. 2, ERM report at 36. The Illinois communities of Gurnee, Island Lakes, and Lincolnshire have noise ordinances with octave-band limits that are as much as 10 [dB] more stringent than the corresponding State noise standards. Indeck Exh. 2, ERM report at 35.

d. Information from Citizens. Mr. Eaton, an attorney representing several groups, including a homeowners association, recommended that local governments be formally apprised, through State guidelines, that local governments have the "right and ability to impose more stringent noise requirements than does the State." Eaton Exh. 1 at 17; Tr.1 at 900. He described how local regulations might be structured:

> [S]uch noise regulations may well be appropriately tied to a plant's proximity to residential areas. It might thus be possible, and we believe this should be encouraged, for an IPP to construct a plant more cheaply, with less expensive noise attenuation, if it is located further away from residential locations, and is located, we would suggest, in a more appropriate location such as a brownfield and/or an existing industrial site where the noise levels are already high and the potential impact on residences is low. Eaton Exh. 1 at 17.[12]

V. WATER QUALITY

In this portion of the Report, the Board summarizes information from the record on (1) wastewater, (2) wastewater regulation, (3) stormwater runoff, and (4) wetlands.

A. Wastewater

Mr. Steve Nightingale of IEPA's Bureau of Water and others discussed wastewater generated from peaker plants, which varies depending on the type of peaker plant. Waste streams identified in permit applications submitted to IEPA include one or more of the following: evaporative cooling water blowdown; cooling tower blowdown; blowdown from a water treatment system; reverse osmosis waste discharge; demineralization blowdown; filter backwash; chiller system water; various drains; and a small amount of sanitary waste. Pollutants expected to be in the wastewater (excluding sanitary wastewater) depend on the type of wastewater generated. They include: total suspended solids; total residual chlorine; pH; temperature; total dissolved solids; calcium; magnesium; iron; manganese; sulfate; chloride; oil and grease; water conditioning chemicals for biofouling and corrosion control; and

[12] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

radioactive isotopes (in some areas). Mr. Nightingale did not address isotopes because isotopes are under the jurisdiction of the Illinois Department of Nuclear Safety. Tr.1 at 141-142; IEPA Exh. 1, Nightingale 6-8; DuPage County Board Exh. 1 at 19; Indeck Exh. 1, Att. 1 at 7.

DuPage County claimed that peaker plant blowdown is fairly innocuous. It has enriched minerals from the supply water and residuals of water treatment chemicals. The treatment chemicals "could include cooling tower biocides . . . or chlorine." The chlorine could affect a receiving water if it is not discharged to a publicly owned treatment works (POTW). DuPage County Board Exh. 1 at 19-20.

Mr. Erjavec of Indeck stated that wastewater from peaker plants is minimal. Incoming water may have to be softened before it goes into the evaporative coolers, and the softening equipment may have to be backwashed occasionally. The backwash is sent to local treatment plants. Both Mr. Erjavec and DuPage County agreed that most of the water sent to the evaporative coolers evaporates, so the wastewater stream coming out is much less than the incoming water stream. Indeck's proposed plant for Libertyville generates about 10,000 gallons of wastewater per day. Tr.1 at 239, 280-281; Indeck Exh. 1, Att. 2 at 33; DuPage County Board Exh. 1 at 9.

Mr. Nightingale of IEPA said that although peaker plants may generate a wastewater that contains a thermal component, the quantity would be small compared to other types of power plants. Tr.1 at 142; IEPA Exh. 1, Nightingale at 7-8. Mr. Erjavec of Indeck stated that thermal discharges from simple cycle peaker plants are practically nonexistent and that there are no thermal discharges from the peaker plants that Indeck is proposing. Tr.1 at 281-283.

Mr. Erjavec said that there may be thermal discharges from an open cycle plant. Open cycle plants do not send wastewater to a sewer. These plants use surface water and then send it back out again. He was not sure if IEPA still permits open cycle plants. Tr.1 at 281-282. Mr. Erjavec stated that there are thermal discharges from combined cycle plants. Heat is generated from cooling the steam that runs through turbines of a co-generation facility. This heat results in a thermal discharge. Tr.1 at 282-283.

IEPA expects that all sanitary wastewater will be discharged to a sanitary sewer. Tr.1 at 142; IEPA Exh. 1, Nightingale at 8. Indeck estimated that sanitary waste flow from its Libertyville peaker plant would have been about 300 gallons per day. Indeck Exh. 1, Att. 1 at 6-7, Att. 2 at 33.

The Village of Libertyville's consultants reported that Libertyville could have handled the wastewater discharges from the proposed Indeck facility and that the discharge would not have a significant impact on Libertyville's wastewater tratment plant. Indeck Exh. 1, Att. 2 at 34. A subsurafce septic system for a peaker plant is an unlikely treatment option due to the

large amount of wastewater generated. DuPage County Board Exh. 1 at 46.

B. Wastewater Regulation

IEPA Director Skinner said that some peaker plants require a permit from IEPA's Bureau of Water. Tr.1 at 54; IEPA Exh. 1, Skinner at 3. Mr. Nightingale of IEPA's Bureau of Water pointed out that not all peaker plants produce wastewater. He testified primarily about wastewater discharge permitting for simple cycle peaker plants. Tr.1 at 138-139; IEPA Exh. 1, Nightingale at 2. Mr. Nightingale said that wastewater from simple cycle peaker plants is either subject to the federal National Pollutant Discharge Elimination System (NPDES) permit program or the State construction and operating permit program, depending on how wastewater is disposed. IEPA administers both programs. Wastewater routed to surface waters would be addressed by IEPA's NPDES permitting program. Tr.1 at 139; IEPA Exh. 1, Nightingale at 2; DuPage County Board Exh. 1 at 46.

Mr. Nightingale said simple cycle peaker plants that dispose of their wastewater to surface waters will be required to obtain an NPDES permit in accordance with 40 C.F.R. 122 and 35 Ill. Adm. Code 309. Permit limitations that apply to peaker plant discharges are the water quality limitations from 35 Ill. Adm. Code 302, the effluent limitations found in 35 Ill. Adm. Code 304, or other technology-based limitations based on "Best Professional Judgment" at 40 C.F.R. § 125.3. Because there is no steam generated at a simple cycle peaker plant, surface discharges are not subject to any federal industrial categorical effluent guideline discharge limitation. Thus, limits are established on a permit-by-permit basis. In addition, any pollution control equipment installed for reducing pollutants in the wastewater below NPDES permit limitations will be subject to a construction authorization in accordance with 35 Ill. Adm. Code 309.154. Tr.1 at 139-140; IEPA Exh. 1, Nightingale at 2-3, 5.

Mr. Nightingale testified that peaker plants discharging to a POTW will be required to obtain a State construction or operating permit in accordance with 35 Ill. Adm. Code 309. Permit limits are established by the local POTW pursuant to 35 Ill. Adm. Code 307 and federal general pretreatment regulations at 40 C.F.R. 403. Tr.1 at 140-141; IEPA Exh. 1, Nightingale at 3, 6.

Mr. Nightingale reported that engineers in IEPA's Bureau of Water review permit applications based on the federal and State regulations described above. The engineers also establish numeric limitations, mixing zones, and zones of initial dilution. The engineers perform a nondegradation evaluation in accordance with the draft nondegradation policy.[13] Engineers will also verify that the discharge location is not to a stream that has been identified as an impaired water for certain pollutants of concern in accordance with Section 303(d) of the

[13] The Board is currently reviewing IEPA's new antidegredation proposal, which could replace the nondegredation proposal. See Revisions to Antidegredation Rules: 35 Ill. Adm. Code 302.105, 303.205, 303.206 and 106.990-106.995, R01-13.

Clean Water Act. Once engineers have set technology limitations, they will include in the draft permit the more stringent of the water quality or technology-based effluent limitations. The draft permit also includes appropriate monitoring and verification requirements. Tr.1 at 140; IEPA Exh. 1, Nightingale at 4.

Mr. Nightingale said that IEPA then provides notice of the draft permit to the public, the Army Corps of Engineers, the United States Fish & Wildlife Service, the Illinois Department of Natural Resources (DNR), municipalities, and IEPA field offices. There is an opportunity to comment and request a public hearing to address concerns about the draft permit. If no hearing is requested, IEPA reviews all comments, makes appropriate changes, and issues a permit. IEPA schedules a hearing if a request is made and there is significant public interest. Before taking final action on the permit, IEPA staff evaluates comments made at hearing and received during the comment period. Tr.1 at 140-141; IEPA Exh. 1, Nightingale at 4-5.

Director Skinner said that IEPA has recently instituted a policy of holding hearings for every peaker plant construction permit. Tr.1 at 58-59. He also said that IEPA is now conducting annual inspections at peaker plants (instead of the old practice of inspecting every three years). IEPA maintains its policy of conducting inspections at any regulated facility (including peaker plants) if it receives complaints. Tr.1 at 57, 174.

As of July 20, 2000, IEPA's Bureau of Water had received eight permit applications from peaker plants. One application each had come from Ford, Perry, Madison, Shelby, DuPage, and Vermilion counties. Two applications had come from Will County. Two of the eight plants were discharging to surface waters and six were discharging to POTWs. As of July 20, 2000, IEPA had granted five of the permits for the peaker plants discharging to POTWs. Wastewater flows in the applications ranged from 25,000 to 361,000 gallons per day. IEPA Exh. 2, Att. 18.

Mr. Nightingale said, for regulatory purposes, some combined cycle plants could also be considered peaker plants. In addition to the regulations outlined in his testimony, combined cycle plants are also subject to the federal effluent guideline discharge standards in 40 C.F.R. 423. IEPA Exh. 1, Nightingale at 3.

Mr. Nightingale said that IEPA's Bureau of Water does not anticipate any adverse environmental impact on the waters of the State from peaker plant discharges, provided those plants receive appropriate permits and follow the limitations set in the permits. IEPA Exh. 1, Nightingale at 8.

DuPage County has incorporated the Board's regulations by reference. DuPage County Board Exh. 1 at 36. All industrial facilities in DuPage County must submit a Spill Prevention and Slug Control Plan to address accidental discharges to POTWs. DuPage County also regulates connections to public sewers. DuPage County Board Exh. 1 at 36-37.

C. Stormwater Runoff

DuPage County stated that stormwater effects from a peaker plant will be similar to those of any other industrial or commercial facility. Lubricating oil, transformer insulating oil, or other maintenance chemicals could contaminate surface runoff if not managed well. One advantage that peaker plants have over other industrial or commercial facilities is that the quantity of stormwater may be smaller. There are no large buildings, and the only other impervious surfaces are pads for some of the equipment. The quality of stormwater from a peaker plant built on a brownfield would depend on pre-existing conditions. DuPage County Board Exh. 1 at 21.

Mr. Erjavec of Indeck stated that "[s]tormwater is captured on site [and] . . . sent to storm sewers after the retention just as you would do with any other development." Tr.1 at 239. Mr. Nightingale of IEPA testified that, pursuant to 40 C.F.R. 122, permits for stormwater discharges during construction activities would be required if more than five acres are disturbed. IEPA Exh. 1, Nightingale at 3. DuPage County regulates stormwater runoff through its County Code. All developments must have a Stormwater Management Permit. DuPage County Board Exh. 1 at 37.

D. Wetlands

DuPage County stated that the United States Army Corps of Engineers has resources and experience to address concerns related to peaker plants sited on or near wetlands. DuPage County Board Exh. 1 at 42. DuPage County's Stormwater Ordinance provides for wetland delineation, mitigation, and possible participation in a wetlands banking program. DuPage County maintains that its ordinance is sufficient. DuPage County Board Exh. 1 at 42.[14]

VI. SOLID WASTE

In this part of the Report, the Board provides a summary of record information on solid waste that peaker plants generate and how the waste is regulated. Mr. Todd Marvel of IEPA's Bureau of Land commented:

> Peaker plants may generate various types of waste that must be managed in accordance with waste disposal regulations found in Subtitle G of Title 35 of the Illinois Administrative Code. By comparison, peaker plants are no different than any other generator of the following types of waste in terms of how the waste is regulated. Any municipal waste generated at the facility, such as general office waste, must be sent to a facility permitted to treat, store or dispose of municipal waste. Any special waste generated at the facility must be managed properly in accordance with the regulations applicable to the specific type of special waste generated. * * * All special waste is subject to the requirements for making a hazardous waste determination under 35 Ill. Adm. Code Section 722.111. Tr.1 at 147-148; IEPA Exh. 1, Marvel at 1.

Mr. Marvel said that special waste is regulated in certain ways depending on whether it is hazardous or non-hazardous special waste. Requirements for generators of hazardous special waste become increasingly stringent as the amount of waste generated per month increases. Mr. Marvel estimated that most peaker plants will generate 100 kilograms of waste or less per month and will be classified as conditionally-exempt small-quantity generators (CESQGs). Tr.1 at 149; IEPA Exh. 1, Marvel at 2.

Mr. Marvel testified that CESQGs are primarily regulated pursuant to 35 Ill. Adm. Code 721.105(g). CESQGs must complete a proper hazardous waste determination for each special waste generated at the facility. Hazardous waste generated must be accumulated in tanks or containers. Finally, these wastes must be sent to a permitted hazardous waste treatment, storage, or disposal facility. Tr.1 at 149; IEPA Exh. 1, Marvel at 2. If a peaker

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[14] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

plant meets these requirements, IEPA Bureau of Land would not require the plant to secure a permit. Tr.1 at 150.

Mr. Marvel mentioned that peaker plants may be located on brownfields. IEPA can provide information on reported releases at brownfields in addition to information on documented cleanup activities. Tr.1 at 150; IEPA Exh. 1, Marvel at 2-3.[15]

VII. WATER QUANTITY

In this portion of the Report, the Board summarizes record information on the potential impact that simple cycle and combined cycle plants may have on the quantitiy of the State's waters. The Board first summarizes information on this subject from State government, then information from local government, and then information from industry. Lastly, the Board provides a summary of concerns raised by State legislators and citizens regarding water quantity.

A. Information from State Government

1. IEPA

Mr. Romaine of IEPA explained how peaker plants use water. As air used in the turbine becomes denser, more air can be pushed through the turbine, which allows more fuel to be burned. As a result, power output will be higher. Air becomes denser as it gets colder, but peaker plants are generally needed most on hot days. Thus, simple cycle turbines used in peaking plants usually have devices to cool the air going into the turbine. IEPA Exh. 1, Romaine at 8.

There are several different types of air cooling systems. In the simplest system, water is injected directly into the incoming air. The air becomes colder by evaporative cooling. This system requires clean demineralized water to prevent excess build up of scale or erosion of the blades in the air compressor. In more advanced systems, water may also be injected into the air compressor. The inlet air may also be cooled indirectly by using cooling coils. In this case, water may still be used in an open cooling tower where evaporation of water dissipates the heat generated by a refrigeration unit. A dry cooling system may also be used. IEPA Exh. 1, Romaine at 9.

Another approach to boost power output is to inject clean water or steam into the burners or to inject steam after the burners. These techniques increase the gas flow through

[15] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

the power turbine and thus increase its power output. IEPA Exh. 1, Romaine at 9.

Mr. Richard P. Cobb is Manager of the Groundwater Section of IEPA's Bureau of Water. Mr. Cobb described the Illinois Water Use Act of 1983 (Water Use Act) (415 ILCS 45/1 (1998)), which abolished the rule on absolute ownership of groundwater. The Water Use Act, to resolve groundwater conflicts and mitigate potential shortages, established a "reasonable use" rule. However, Mr. Cobb said that most Illinois court decisions have interpreted "reasonable use" for groundwater as being any use except for malicious or wasteful purposes. IEPA Exh. 1, Cobb at 2-3.

Mr. Cobb reported that Governor Ryan, by Executive Order, established the Water Resources Advisory Committee (WRAC). The WRAC will focus on water resources and water use, including the effects of peaker plants. The WRAC will also examine economic and social issues related to other power facilities and water use. The WRAC is to present recommendations to Governor Ryan.[16] IEPA Exh. 1, Cobb at 3.

2. DNR

Dr. Brian Anderson is the Director of the Office of Scientific Research and Analysis (OSRA) within DNR. He testified that there is little State regulation of water withdrawals from surface waters and groundwater. However, withdrawals from Lake Michigan are regulated. Dr. Anderson asked Dr. Derek Winstanley, Chief of the Illinois State Water Survey (ISWS), a division of the OSRA of DNR, to summarize some of the water quantity issues relating to peaker power plants. Tr.1 at 151-152; DNR Exh. 1 at 2.

Dr. Winstanley stressed that peaker plant water use and the impacts on groundwater resources should be examined in the context of overall demand for water, including demand from domestic use, municipal use, agricultural use, and other industrial uses. Tr.1 at 153.

The water demands from peaker power plants vary widely, depending upon how the plants are designed and used and how many days they operate. Dr. Winstanley studied simple cycle plants producing from under 100 MW to about 1,000 MW and operating from 20 to 90 days per year. They use approximately 0.07 to 2 million gallons of water per day. Annually, the range would be about 1.4 to 180 million gallons of water per year. Tr.1 at 153-154; DNR Exh. 2 at 2.

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[16] To assist the WRAC in its work, Chairman Manning, who sits on the WRAC on behalf of the Board, forwarded a letter to the WRAC on October 25, 2000, attaching summaries of information on water use from these inquiry hearing proceedings and on the regulatory frameworks that other Midwestern states have with respect to water use. Chairman Manning's submittal is attached as Appendix G.

Dr. Winstanley also examined combined cycle plants, which range from 500 to several thousand MW of electricity and are intended to operate almost continuously. These plants consume about 5 to 20 million gallons of water per day. Annually, this would equal approximately 1.5 to 6 billion gallons of water per year. Thus, simple cycle plants consume a fraction of 1% to about 3% of the water that typical base-load combined cycle plants use. Tr.1 at 154-155.

For comparison purposes, Dr. Winstanley examined municipal water use in Champaign-Urbana, which has a population of about 120,000. Champaign-Urbana currently consumes about 20 million gallons of groundwater per day, which translates into an annual use of about 7.3 billion gallons per year. In comparison, a simple cycle plant would use the same amount of water as 25 to 3,000 people. Tr.1 at 155.

Dr. Winstanley then discussed sustainable yield (also called potential yield) for groundwater. Basically, sustainable yield is the amount of groundwater that can be maintained over the long term so that it can be used both by the current population and by future generations. Determining sustainable yields is a complex exercise involving variables, such as rainfall, recharge rates, and geology. Currently, there is not an accurate estimate of sustainable yield for most Illinois aquifers. Better scientific data and modeling capabilities are needed for more accurate estimates, but these studies are costly. Tr.1 at 155-156.

Dr. Winstanley thinks that there should be studies on public values regarding water use, coupled with studies on the amount of water used. Tr.1 at 156. Water quality is also an important parameter. Natural variations of chemicals and minerals in the groundwater throughout Illinois can effect the operation of and discharge from peaker plants. Tr.1 at 156-157.

Dr. Winstanley stressed that aquifers must be paramount in an analysis of groundwater. Groundwater typically is found in discrete aquifers, and aquifers usually transcend political jurisdictions. Individual communities cannot solve groundwater problems in the long term. Illinois would benefit by establishing "comprehensive regional water resource planning and management" that would entail planning based on aquifer boundaries. Winstanley also stressed that surface and groundwater use (*i.e.*, aquifers, river basins, and water sheds) must be considered together. Tr.1 at 157-158.

Dr. Winstanley pointed out that the current law of "reasonable use" does not impose quantitative restrictions on water use. DNR Exh. 2 at 4. Although new laws and regulations may be necessary, Dr. Winstanley maintained that the State should encourage local communities to solve their own water resource problems. Tr.1 at 159. Dr. Winstanley cited an "excellent model" of water resource planning in Central Illinois. The Mahomet Aquifer extends from the Illinois River across to Indiana and lies underneath 15 counties. Recently, the local communities in those 15 counties formed the Mahomet Aquifer Consortium. The Consortium is planning for future use of water resources by better characterizing and managing

the aquifer. Tr.1 at 159.

Dr. Winstanley expressed concern about other aquifer systems that transcend political boundaries. Limiting groundwater withdrawals in one community will not solve groundwater supply problems if other communities do not limit withdrawals. Water supplies in the Cambrian-Ordovician aquifer underneath Northeastern Illinois may be strained if too many simple cycle and combined cycle facilities use the aquifer. DNR Exh. 2 at 3.

Dr. Winstanley also reported that allocating water from Lake Michigan is constrained by Supreme Court decree and international agreement. The State has the power to limit diversions of water from large rivers to maintain minimum base flows. However, the State does not have this power over moderate-sized streams, and large diversions could adversely affect aquatic habitat, wastewater assimilation, and recreation. DNR Exh. 2 at 3-4.

B. Information from Local Government

1. Will County

Mr. Michael Shay, Senior Planner for Will County, is responsible for long-range planning. He testified that one of Will County's biggest concerns with respect to peaker plants is its aquifer reserve water of about 66 million gallons per day. This reserve is Will County's water supply. Mr. Shay said that there is also some concern about the quantity of river water. His research indicates that combined cycle plants use five to 12 million gallons a day per facility and that simple cycle plants use roughly a million gallons a day per facility. Mr. Shay is very concerned that simple cycle plants in Will County will be converted to combined cycle facilities in the future. It would only take a few combined cycle facilities to use up the entire reserve water capacity for Will County. Tr.1 at 707, 709-710.

Mr. Shay added that Will County is the fastest growing county in Illinois. He predicted that problems may arise as simple cycle plants and combined cycle plants compete with a growing population for reserve water capacity. Tr.1 at 710-711. Mr. Shay is also concerned about the manner in which a combined cycle facility collects its water. The facility would drop a well into an aquifer and pull it up at a rate that creates a drawdown. The level of the aquifer would drop in the shape of a reverse cone with a radius of six miles, a 300-foot drawdown at the point of the well, and a 35 to 50-foot drawdown at the six-mile radius. If this drawdown were to occur across the county, thousands of residential, industrial, and group wells might fail. Tr.1 at 711.

Chairman Manning and Board Member Kezelis asked Mr. Shay where he obtained the figures regarding drawdown and the amount of water used by simple cycle plants and combined cycle plants. Mr. Shay replied that the information on aquifers and reserve capacity came from the ISWS, including the ISWS Web site. Mr. Shay said that the numbers on the water demand at simple cycle and combined cycle plants came "from the industry itself." For

example, Will County officials talked to engineers who have built a simple cycle unit in Elwood and are planning two additional simple cycle units there. The engineers said that if the three simple cycle units all became combined cycle units, water use at Elwood would total 16 million gallons of water per day. Tr.1 at 719-721, 729-730.

Board Member McFawn asked Mr. Shay if Will County is only concerned about the drawdown from simple cycle and combined cycle plants, as opposed to drawdown from other industries. Mr. Shay replied that simple cycle and combined cycle plants are the only concern now. It is the only industry Will County knows of that draws such a large amount of water in a short period of time. To illustrate his point, Mr. Shay said that three combined cycle facilities, each with water needs of 16 million gallons of water per day, could use up all of the water in the Fox River if their intakes were located in St. Charles. Tr.1 at 719.

Board Member Kezelis asked Mr. Shay how Will County is currently addressing the potential water problem. Mr. Shay replied that Will County has passed an initial set of regulations to govern water use. Will County is in the process of researching a second set of regulations. Mr. Shay speculated that the second set would "prohibit the use of aquifer water for electric generation." Tr.1 at 713. Board Member Girard asked Mr. Shay if the probable prohibition on using aquifer water would also apply to facilities inside a municipality in Will County. Mr. Shay replied that the prohibition would not affect municipalities. Tr.1 at 721-722.

Board Member Flemal asked Mr. Shay how government should regulate water use. Mr. Shay said that he would favor statewide or national regulation of drawing water from wells. He said that aquifers do not fit jurisdictional boundaries and local authorities are "played against each other by the private industry." Tr.1 at 724.

2. Lake County Board

Ms. Bonnie Thomson Carter is the Lake County Board Commissioner for the 5th District and Chair of the Public Works and Transportation Committee. Tr. 1 at 778; Lake County Exh. 3 at 1. Ms. Carter received a call in 1998 from two of her constituents. They were concerned about a base-load power plant to be located near their homes in the Village of Island Lake. Ms. Carter learned about the potential adverse effects of the base-load plant, and the biggest environmental concern was the projected water use. The plant would have used four to eight million gallons of water per day, which, according to the ISWS, is greater than the demand for the entire village. Tr. 1 at 792-793.

Although the Island Lake base-load plant proposal was withdrawn, Ms. Carter remained concerned about water use in simple cycle plants. Even though water use is not as great with simple cycle plants, they can easily be converted to combined cycle plants. Tr. 1 at 794, 798-799.

In February 1999, Ms. Carter and her constituents met with two State legislators, IEPA Director Skinner, and other officials from IEPA and DNR. Ms. Carter learned that no State agency had authority to limit groundwater withdrawals. Ms. Carter said that the Water Use Act and the Water Authorities Act do not give counties the authority to regulate groundwater withdrawal. She also said that IEPA officials were "frustrated" that they could not consider the regional impact of peaker plants in reviewing construction applications. Ms. Carter was "surprised and shocked" that each bureau at IEPA did its own review of peaker plant applications without consulting each other. She was pleased that IEPA's review process for peaker plants was subsequently lengthened from 90 days to 180 days. Tr. 1 at 794-795, 800.

Ms. Carter asked the Board to consider the cross-jurisdictional water use problems that multiple peaker plants could cause if sited in close proximity to each other. "The water consumed in one village not only limits the supply of its immediate neighbors, but impacts the supply of further villages, commercial wells and deep community wells which draw from the same aquifer." If the Island Lake proposal had been approved, the taxpayers of the Village of Wauconda would have incurred expenses of $1 million to reset the pumping well head in two municipal wells. These taxpayers had no voice during the application review. Tr. 1 at 796-797.

Collecting and studying groundwater data is an expensive process. It would cost several million dollars to determine a sustainable level of water use in Lake County. Local communities cannot reasonably shoulder the burden of paying for collection and analysis of groundwater data. However, communities need this data to make informed water use decisions. Tr. 1 at 797.

In August of 1999, Dr. Winstanley of DNR reported that Lake County will maximize its water use around 2030. Water demand is up, but water supplies are limited. Northern Illinois has already reached the maximum sustainable level of water use in deep bedrock, and water from Lake Michigan is already fully allocated. Tr. at 797-798.

Research indicates that excess withdrawal of groundwater can decrease water availability for streambeds, wetlands, and lakes. The quality of the existing water may be threatened, which may harm animal and plant life. Tr. at 798.

Ms. Carter wants to share her expertise with all relevant State agencies to make proper decisions about the power industry. She said that construction applications should indicate whether proposed power plants are simple or combined cycle. In addition, simple cycle plant applicants should indicate if they intend to convert a simple cycle plant to a combined cycle plant. A regional group with regulatory authority should review applications. Ms. Carter said that the Lake County Board has recommended legislation that regulates aquifer drawdowns. She wants the Sate to determine the meaning of "reasonable use." As a member of the WRAC, Ms. Carter said that the WRAC was scheduled to address these issues and make recommendations to Governor Ryan in December 2000. Tr. 1 at 799, 800-801.

Ms. Carter stated that the Board does not have the authority to regulate groundwater withdrawal. However, she asked that the Board institute a moratorium on all pending and new applications for peaker and base-load plants until government agencies have addressed the negative consequences of peaker plants. Tr. 1 at 800.

Ms. Carter realizes that, besides power plants, residential, commercial, and other industrial development will burden water sources. She also realizes that electricity may be in short supply. However, she is not convinced that locating peaker plants in Lake County will alleviate a possible power shortage there. Tr. 1 at 799.

3. Lake County Public Water District

Mr. Daniel J. Kucera, an attorney with Chapman & Cutler, testified on behalf of the Lake County Public Water District. The District has a peak demand of six million gallons of water per day, and an average demand of between three and four million gallons of water per day. Tr.1 at 761, 776.

Mr. Kucera said that combined cycle plants, which use steam to generate a portion of electrical output, can be expected to use more water than small simple cycle plants, which use water only for cooling. Tr.1 at 761-762. He was concerned that generally there is no permitting process or regulatory oversight of water use by peaker plants. IEPA acknowledged that it currently has no responsibility over peaker plant water use. Tr.1 at 763.

Mr. Kucera said that a public water supply would need permission from DNR to supply a new peaker plant with Lake Michigan water. Diverting and allocating water from Lake Michigan is limited by statute. See 615 ILCS 50/1 *et seq*. Tr.1 at 763-764. Mr. Kucera claimed that Lake Michigan water is perceived to be superior to groundwater and that there is a great demand for domestic use of Lake Michigan water. Accordingly, he thinks that the use of Lake Michigan water in peaker plants should be limited or prohibited. Tr.1 at 763-765.

Mr. Kucera testified about the problems with water from sources other than Lake Michigan. Water from aquifers in Northern Illinois often has high levels of iron, manganese, and other constituents that raise aesthetic issues and that can require costly treatment facilities. Water from deep wells often contains radium or alpha particles. In parts of Northern Illinois, water levels are lower in aquifers, and some deep wells have been mined into salt water. Tr.1 at 763, 765.

Mr. Kucera pointed out that groundwater is a limited resource in certain portions of the state, especially in parts of Central Illinois. He stated that aquifers in Northern Illinois have also been diminished. Tr.1 at 765-766.

Mr. Kucera testified that the Water Use Act provides that the rule of "reasonable use"

applies to groundwater withdrawals, but it does not provide for permitting or regulation of reasonable use. Section 5 provides that the owner of a proposed well expected to withdraw over 100,000 gallons of water per day must notify the local soil and water conservation district. The district must notify other units of local government whose water systems may be impacted. The district must also review the impact and make findings. However, the Water Use Act provides no enforcement mechanism, and it does not apply to areas of Illinois near Lake Michigan. Tr.1 at 763-764.

Mr. Kucera wants regulatory oversight of water use at peaker plants because they use upwards of several million gallons of water per day. The potential effects of the drawdown upon aquifers and groundwater should be evaluated as part of the permitting and regulatory process. Tr.1 at 765. Mr. Kucera also wants peaker plant withdrawals from surface water to be evaluated. He claimed that the withdrawals could reduce the resource value of the water body for domestic water supply, aquatic life, or recreation. Tr.1 at 766.

Mr. Kucera shared his concerns about decommissioning peaker plants, specifically with respect to accountability. He asked who would be responsible for resulting excess capacity in the local public water supply, for capping a peaker plant's wells, and for leakage from a plant that contaminates a local utility's or residential well's source of water. Mr. Kucera thinks that there should be a decommissioning procedure to protect water sources and the public. At the very least, there should be a state-administered trust account, funded by peaker plants, to provide remediation and restoration funds if owners abandon plants without protecting water resources. Another possibility is to require owners of peaker plants to post a surety bond or letter of credit. Tr.1 at 767-768.

Mr. Kucera expressed concern about siting clusters of plants. Currently, siting of electric generating plants is a local issue. If some recent proposals are approved, multiple peaker plants could be sited in close proximity to each other. Mr. Kucera is concerned about the impact of multiple drawdowns on an aquifer at one location. Tr.1 at 768-769.

Mr. Kucera is also concerned about the lack of regulation for cross-connections. As an example, he described a peaker plant that is partially served by a public water supply and partially served by the plant's own wells. The public water supply may provide water for domestic use and fire protection. The peaker plant uses its own wells for process water. However, the public water supply might also provide backup if the wells are out of service. A local government may not have the staff or the skills to monitor for cross-connections at peaker plants. Mr. Kucera asked who would regulate cross-connections and protect the public water supply. Tr.1 at 770-771.

Mr. Kucera is aware that the WRAC may consider water issues related to peaker plants, but he does not know if the WRAC is soliciting public comments. Therefore, Mr. Kucera asked that the Board include water use issues when reporting to Governor Ryan on peaker plants. Tr.1 at 771.

In conclusion, Mr. Kucera suggested that Illinois adopt a regulatory oversight requirement (including permitting) for process water used by all electric generating facilities. Tr.1 at 771.

C. Information from Industry

1. ComEd

Ms. Arlene A. Juracek and Mr. Steven T. Naumann of ComEd asserted that during the planning and development of any peaker plant, they carefully assess the possibility of water contamination and the affect on water supply. They noted that the WRAC will examine peaker plants' impact on water resources and water use. ComEd Exh. 1 at 13-14.

2. MWIPS

Ms. Greenberg of MWIPS asserted that the simple cycle technology currently used for peaker plants typically places a small demand on water resources. As a basis of comparison, she noted that one peaker plant in Kane County used no more than 2.5 million gallons of water per year. In contrast, an average golf course in the Great Lakes region uses almost 31 million gallons of water per year. She recommended that the Board consider the WRAC report on water supply. MWIPS Exh. 1 at 7.

3. Indeck

Mr. Erjavec of Indeck testified that water consumption depends on humidity and temperature. Little water will be used on high humidity days. Maximum consumption occurs on hot and dry days. He noted that a typical 300-MW plant uses a maximum of 80 gallons of water per minute, and an average of about 40 gallons per minute. Eighty gallons per minute is equal to 11 homes watering their lawns at the same time. Tr.1 at 222, 226, 238-239.

4. CPI

Mr. Jirik of CPI testified that his company's plant currently takes its non-contact cooling water from the Sanitary and Ship Canal for use in its corn wet milling operation. The cooling water is then returned to the Canal. CPI plans to use its existing cooling water flow to supply cooling water to its new co-generation operation. After servicing the co-generation operation, CPI will return the water to the Canal as is does now. The co-generation operation will not increase CPI's current water withdrawal and will not result in any new discharges. Tr.1 at 630, 634.

D. Concerns of State Legislators and Citizens

1. State Legislators

State Senator Terry Link testified that regulators must address peaker plants on a regional basis because peaker-related issues, such as air quality, water supply, natural gas supply, noise, and taxes are cross-jurisdictional. Tr.1 at 751-753. State Representative Susan Garrett testified that she is concerned about water supplies from aquifers. Tr.1 at 754-755. Ms. Sally Ball testified on behalf of State Representative Lauren Beth Gash. Ms. Ball said that Representative Gash's constituents are understandably worried about the impact of peaker plants on air quality and water supplies. Tr.1 at 757.

2. Citizens

NRDC commented that "many of these proposed single cycle combustion turbine projects maybe converted in the future to combined cycle . . . . A single cycle generating unit may not tax available water resources for example, but its conversion to combined-cycle operation could create significant allocation quandaries for the host community." PC 109 at 6. NRDC stated that "[s]ingle cycle combustion turbines are not particularly water intensive, consuming less than 100,000 gallons per day," but "[w]hen firing distillate fuel oil, water consumption rises to up to 1,000,000 gallons per day when steam injection is employed to reduce NO_x emissions. In comparison a 1,000 MW combined cycle natural gas-fired combustion turbine relying upon wet cooling consumes approximately 7,000,000 gallons per day." PC 109 at 7.

Ms. Zingle of LCCA testified that some peaker plants use vast amounts of water. She stated that water supply is not a local issue. She further alleged that the proposed peaker plant for Zion is going to use as much as the entire city of Zion uses. Tr.1 at 507, 516. Ms. Cathy Johnson, Vice Chair of the Rural and City Preservation Association, testified that the proposed standards in McHenry County barely consider water. She argued that it is ridiculous that a new peaker plant only has to report how the water it uses affects the area within one-quarter mile of the plant. Tr.1 at 545, 552.

Ms. Connie Schmidt, a representative of River Prairie Group of the Illinois Sierra Club, testified that, despite living in the incorporated town of Warrenville in DuPage County, she and her neighbors have wells and septic tanks on their properties. Groundwater use and disposal of the groundwater after it has been used are realistic concerns in her area. Tr.1 at 463, 467. Mr. Mark Goff, also a resident of Warrenville testified that he lives 2,000 feet from a proposed peaker plant site. He is also concerned about the effect on his well water. Tr.1 at 468-469.

Ms. Stark of CARE testified that the aquifers located beneath the closed Texaco Refinery in Lockport are joined together. The aquifers are the primary source of municipal water in Lockport and she is concerned that a local peaker plant could use thousands of gallons

of water per day.[17] Tr.1 at 644-646, 654.

VIII. RESTRUCTURING AND ITS IMPACTS

In this part of the Report, the Board summarizes the information from the record on the electric industry restructuring and its impacts. Specifically, the Board summarizes (1) introductory information on the resructuring or deregulation of the electric industry, (2) information on the history of deregulation, (3) information on the environmental effects of deregulation, (4) information on the impacts of deregulation on local zoning, (5) information on current and future retail and wholesale energy markets, (6) information on the supply and demand for electric power, (7) information on the need for peaker plants in Illinois, (8) information on importing and exporting power generated by peaker plants, (9) information on Illinois' lack of a statewide energy plan, and (10) information on how peaker plants affect electric transmission and distribution systems.

A. Introduction

Providing electricity to retail customers can be broken down into the generation, transmission, and distribution of power. The electricity that a power plant generates is typically transmitted over a national power grid at high voltages from generating plants to substations and distributed at lower voltages to homes and businesses. Tr.1 at 17. Historically, regulated and vertically integrated monopolies provided all three services as a single bundled product to customers. State commissions approved siting of generators based on the need for power and rates for utilities according to their cost of providing the service. ComEd Exh. 1 at 5.

Federal and State laws have largely restructured the electric industry over the last ten years. As Mr. Christopher Zibart of ComEd noted, the federal Energy Policy Act of 1992 and the Federal Energy Regulatory Commission (FERC) directed utilities to "transmit power for others pursuant to a tariff, on an open access, non-discriminatory basis, assuring that new generating sources will be able to sell and move their power." PC 164 at 5. Executive Director Fisher of the ICC stated that "excess power generated by a company in one area [of the electric grid] may . . . be sold and delivered over transmission lines to a company in another area for [resale] to customers in that utility's service territory." Tr.1 at 17.

Introducing the "wholesale wheeling" of electricity spurred states to further restructure the electric industry. Several states, including Illinois, are beginning to move away from monopoly-based market structures, towards much more competitive market structures. Tr.1 at

[17] For summaries of aditional public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

16. In 1997, the Illinois General Assembly passed a law to freeze 1996 electric rates until 2004 and to progressively deregulate the electric industry. See 220 ILCS 5/8-503. Under the new structure, a "customer's generation, transmission, and distribution may be supplied by different companies." ComEd Exh. 1 at 5. In the next few years, Illinois residents will be able to choose between different retail suppliers of electricity. "Generation, in particular, is becoming a competitive industry, and market forces [of] supply and demand will set energy rates." ComEd Exh. 1 at 5. According to ComEd, "a free market for electric generation will lead ample capacity at reasonable prices." PC 164 at 1.

A number of factors are attracting new generators to provide power during peak demand hours. Those factors include deregulation, rising energy costs, increased demand for power, the relatively low cost of constructing modern gas-fired turbines per kW of generating capacity, the speed of construction and operation, the closure of base-load electric plants, and the adversity to building new transmission lines. These new peaker plants use combustion turbines that the ICC states cost less to run, are easier and faster to build and operate, and can use natural gas, which until lately, has been a less expensive source of fuel. Tr.1 at 25-27; ICC Exh. 1 at 3-5.

With the shift from regulation to a market-driven field, the only remaining controls are environmental protection and local zoning procedures. Reliant stated that Illinois must balance the benefits of meeting the State's demand for electricity with "continued progress in cleaning up the air, protecting its water supply, avoiding noise pollution and protecting property values in communities where these plants are located." PC 1 at 5. ComEd stated that changing the regulatory system will impact the market for power generators, and could adversely affect the retail price of electricity. ComEd Exh. 1 at 5. IERG stated that "each obstacle or cost added to constructing peakers will, at best, be reflected in the cost of electricity and, at worst, will deter any decision to construct [generating plants]." Tr.1 at 309-310. "The decision could leave Illinois without necessary electric capacity." Tr.1 at 309-310.

Illinois deregulation has shifted the burden of siting generators from the ICC to local zoning boards. Tr.1 at 246; PC 107 at 6. State and federal changes attract construction of non-utility generators to satisfy the peak demand for electrical power. ICC Exh. 1 at 5. While the ICC had and continues to have siting authority for utility generators, the new IPPs do not fall under the certificate program. The shift in the trend towards building peaker plants has largely left municipal zoning boards to decide whether to place plants in their area. ComEd Exh. 1 at 8; PC 107 at 6; Tr.1 at 868. Several groups testified that the municipal boards do not have the ordinances, experience, or resources to properly address the concerns surrounding peaker plants. Tr.1 at 386, 389-390, 436-437, 460, 511, 868, 916-917 and 1,021-1,022. Citizens testified that both municipalities and residents must expend a large amount of money in either reviewing or opposing the new plants, and may face legal fees if the IPP decides to sue the municipality for voting not to site the plant. Tr.1 at 521-522, 550, 972.

The electric industry largely believes that Illinois must construct peaker plants to match

the growing rate of demand. The companies claim the shrinking reserve margins for electric power and the 1998 wholesale market price spikes show the need for increased supply of electricity. Tr.1 at 324. According to ComEd, Ameren, and MWIPS, placing peaker plants within a utility's control area increases the system's reliability. Tr.1 at 324, 340. Mr. Earl Struck, President of the Association of Illinois Electric Cooperatives (AIEC), stated that "[s]ufficient generation capacity is absolutely essential to fulfilling the responsibility of providing adequate, reliable energy at an affordable price." PC 111 at 3.

Many citizens question whether the explosive number of requests to build peaker plants is excessive compared to the growth of peak-demand for electricity. Tr.1 at 390, 494-495, 502-503, 510, 542, 557-559, 701. They are concerned that companies will build plants that will export power to other states at the detriment of the health and environment of local communities. Tr.1 at 390, 502-503, 542 and 559. Citizens also expressed concern that the proliferation of the peaker plants cuts against programs that use alternative fuel resources. Tr.1 at 496 and 649. They feel that we can use several viable forms of alternative fuel resources to help meet the growth in peak demand for electricity. Tr.1 at 496, 649.

The reduced ICC regulation of the industry also leads to a lack of statewide oversight of the supply and demand of electric power. Because the ICC no longer can require utilities to provide reports on the generation, import and export of power, it cannot continue to play a formal role in maintaining an energy portfolio for the State. Moreover, ComEd claimed that MAIN, which provides regional oversight of electric power generation and transmission, is being phased out on the federal level in favor of new transmission organizations. Tr.1 at 38-39. Illinois currently has not designated a government body to formally track statewide supply and demand of electric power. Tr.1 at 779-780; Tr.2 at 61.

Many citizens expressed concern that peaker plants sited in Illinois would export power to other states. Tr.1 at 390, 502-503, 542, 780, 1,024. Power companies and other experts disagreed about whether exporting power was feasible or profitable and whether the transmission and distribution systems in Illinois can handle the proposed growth in generating capacity. Groups testified that parts of the transmission grid are outdated and hinder exporting power to other states, such as Wisconsin. Tr.1 at 598, 706-707; Tr.2 at 50; Lake County Exh. 4 at 7-8. Local residents may resist updating the system because of their concerns about potential health effects from the lines. Tr.1 at 975.

B. History of Deregulation

For most of the 20th century, natural monopolies held the United States electric industry. As Executive Director Fisher of the ICC explained:

> Government agencies designated stockholder-owned companies to provide electric service to the public within specific service territories.

* * *

> Each and every day, excess power generated by a company in one area may, in fact, be sold and delivered over transmission lines to a company in another area for resell to customers in that utility's service territory.
>
> For the most of the last century, these transactions were primarily made by regulated entities in the interst of security and reliability of the grid. Tr.1 at 17-18.

State and federal governments jointly regulated the electric industry. FERC regulates the wholesale and interstate transmission of power. Tr.1 at 18. States appointed public utility commissions, such as the ICC, to regulate power distribution from electric utilities to the end-user customer. Tr.1 at 18.

Under the old Illinois regulatory system, the ICC controlled siting and certifying new generating facilities, and set rates for utilities based upon their costs of serving customers in their area. ComEd Exh. 1 at 8; Tr.1 at 867-868. IEPA decided "whether to issue the necessary permits covering issues such as air pollution." ComEd Exh. 1 at 8; see also Tr.1 at 867. According to Mr. Eaton, counsel for several organizations, including a homeowners association, deregulation in Illinois "has left [IEPA's] responsibilities in this area largely unchanged, but has removed the ICC from the equation, for all intents and purposes." Tr.1 at 867-868.

1. Federal Rate Cases

Executive Director Fisher explained how the federal rate cases developed and how they impacted the deregulation of the electric industry. He stated that the federal government historically granted monopoly service territory to electric utilities as long as they served all retail customers without discrimination or delay at a price set by the regulatory commission. FERC set prices during periodic cases, now known as rate cases. Tr.1 at 18. Statutes required rates to be just and reasonable for both utilities and customers. According to Executive Director Fisher, the "basic theory was to allow the utility to recover its reasonable expenses as well as to provide a fair return on the investment." Tr.1 at 19.

As Executive Director Fisher explained, "[f]or the first two-thirds of the 20th century, rate cases generally resulted in a gradual lowering of prices as utilities enjoyed the efficiencies of technological improvements and economies of scale." Tr.1 at 20. Each utility built generating plants, expecting growth in demand for power that it was obligated to provide. Some utilities imported excess power from other utilities rather than build generating plants when it was more economical. Tr.1 at 20.

The cost of electric power significantly increased for most customers in the 1970s and 1980s. Electric prices rose for consumers because of unexpectedly higher costs of building and operating nuclear plants. Other utilities faced increased costs from general price inflation and compliance with air pollution standards. Tr.1 at 21. The increase in prices led to a state and federal movement towards deregulation in the 1990s.

Federal policy significantly changed with the introduction of "wholesale wheeling." Executive Director Fisher commented that the Energy Policy Act of 1992 authorized FERC to "require public utilities owning transmission lines to make those lines available to wholesale market participants who wished to move electricity from one part of the grid to another." Tr.1 at 21-22.

In 1995, FERC responded to the Energy Policy Act by issuing Order No. 888, which required electric utilities to give generators access to the transmission grid on a non-discriminatory basis. ComEd Exh. 1 at 5, citing Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities and Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, Order No. 888 (Order No. 888), FERC statutes and regulations, preambles for regulations, January 1991 - June 1996, 31,036 (1996); see also Tr.at 22. Utilities had to provide transmission authority to out-of-state generators, and according to the ICC, have done so at a fair price. Tr.1 at 22. For example, an Illinois utility must now allow an Ohio generator to carry power over its transmission lines. ICC Exh. 1 at 3; Tr.1 at 22.

In 1992, "most transactions between utilities were 'cost based' and the highest price paid for energy and capacity was that authorized by FERC as 'not to exceed' the FERC authorized rates." Lake County Exh. 4 at 9. Utilities that greatly needed power would pay a maximum emergency tariff of generally $100/MW hour (MWh), or 10% plus out of pocket costs. Lake County Exh. 4 at 9. Utilities entered into contracts "knowing that their maximum exposure or risk of having [to] fulfill their sale commitment was measurable, calculated, and deemed to be acceptable because the maximum exposure was no more than the Emergency power rate." Lake County Exh. 4 at 9-10.

Between 1992 and 1999, the number of power marketers increased from a few to over 300. Lake County Exh. 4 at 10. Marketers bought electricity by price rather than costs, and purchased power as a commodity. Lake County Exh. 4 at 10. "The biggest problem with market rates was the regulators and retail customers were not prepared for the change." Lake County Exh. 4 at 10.

Executive Director Fisher testified that wholesale wheeling encourages long haul transmission of electric power more than in the past. Tr.1 at 44. However, utilities can place FERC-approved tariffs on access to their transmission lines. When a company wants to transport power over transmission lines that another utility owns, the company must pay the filed tariff to the utility to use the lines. The company must pay the rates of each utility for the

lines used to transmit its electricity to its destination. The rates compile or "pancake." Tr.1 at 43. Executive Director Fisher noted that, although FERC granted wholesale access to utility transmission lines, wheeling tariffs cause longer transmission hauls to be more costly. Tr.1 at 27.

Executive Director Fisher stated that FERC Order No. 888 "opened the interstate system to wider access and made non-utility generation economically attractive over short distance[s]." Tr.1 at 28. For example, ComEd has "pursued a policy of nondiscriminatory cooperation with [IPPs] wishing to locate in Northern Illinois and interconnect with ComEd's system." ComEd Exh. 1 at 6.

FERC based the electric utility model on its previous success with the natural gas industry. Tr.1 at 30. FERC regulates the national transfer of gas through interstate pipelines. The commission deregulated the natural gas industry in the 1980s. Tr.1 at 30. According to the ICC, prices have dropped and the natural gas market is very competitive. Illinois customers buy 40 to 50% of their natural gas from non-utility providers. Tr.1 at 31.

2. States Start to Deregulate Electric Utilities

In the late 1980s and early 1990s, companies that needed to compete internationally, in part by cutting energy costs, lobbied their state capitols for the right to buy power on the wholesale market. Some states, beginning with California and Pennsylvania, have responded by moving to deregulate the electric industry. Tr.1 at 22-23.

The Wall Street Journal wrote that, in the summer of 2000, "several of the 24 states that began opening their electricity markets to competition in 1996 [were] struck by extreme price volatility and, in some cases, power shortages." PC 11 at 2. The Wall Street Journal reported on August 14, 2000 that the problems were caused by a combination of factors, including "higher-than-expected demand, fewer new generating plants than necessary to keep up with it and an interstate transmission network that wasn't built for the deregulated world." PC 11 at 2. The article stated that "[n]owhere has the situation been more critical than in the San Diego region, the first area of the country where retail electricity prices have been dictated solely by market forces." PC 11 at 2.

a. California Deregulation. Several factors played into why many consumers' bills doubled in San Diego. Generally, extreme heat and stunted growth in supply caused rates to rise for California customers over the summer of 1999. Tr.1 at 294; Tr.2 at 38-39. A number of utilities claim that California stunted its electric supply when it deregulated electric utilities, but chose to maintain "tight regulatory control over . . . wholesale prices and approval for new generation." Tr.1 at 293-294; Tr.1 at 834. The Illinois Energy Association (IEA) stated that it is "undoubtedly true that the lack of adequate power supply is at the heart of the problem in that state." Tr.2 at 40. "Several state policies discouraged new construction at a time when demand continued to surge." Tr.2 at 40. IEA testified that "[b]etween 1996 and 1999,

California added only 2 percent to its generating capacity." Tr.2 at 40. According to Ameren, "California attempted to control natural market forces, which resulted in an imbalance between electric supply and demand." PC 107 at 13. Reliant agreed, stating that "the state's environmental and regulatory mandates have hampered the siting and approval of new plants in recent years." PC 1 at 4.

NRDC testified that "the conventional wisdom is that electricity consumption in California is surging out of control; 'the Internet' and a booming economy often are frequently invoked as explanations." PC 109 at 4; Tr.2 at 39. According to Reliant, the previous reserve margin of 35% from the early 1990s disappeared while the California economy soared and summer temperatures were unseasonably high. PC 1 at 4. As a result, the existing generators, which are relatively old, run harder and under more stressful conditions, decreasing reliability and increasing chances of outages. PC 1 at 4.

The increase in 1999 customer rates occurred when costs of wholesale power were directly passed onto retail customers. Tr.1 at 35. This was due in part to existing generators that quickly paid off their mandatory stranding costs. Mr. Greg Elam, CEO of the energy management consulting firm of American Energy Solutions, Inc. (American Energy), explained that stranded costs are "basically a subsidy given to compete in a transition into a competitive market." Tr.1 at 815. Ms. Arlene Juracek of ComEd testified that, when California power companies "exhausted their stranded cost recovery, their customers were essentially put on the spot market for electricity." Tr.1 at 304. According to ComEd, "no one buys all of their supply on the spot market." Tr.1 at 304. For example, San Diego Gas and Electric paid off its stranded costs early, and was able to pass along market costs to residents in its service area. Tr.1 at 304. Companies that paid off their stranded costs also had less incentive to sell power at low rates to California residents rather than export the power at a higher rate to customers in another state. Tr.1 at 838.

IEA testified that when California could not meet the peak demand for electricity, it had to import power from other states. California was importing a lot of power and has not "added any power to speak of since then." Tr.2 at 56. When it faced power shortages, California "couldn't get out-of-state power suppliers to sell power into California at the artificially low prices that the government was setting." Tr.2 at 56.

NRDC contested the premise that inadequate supply remains at the heart of the problem in California. "In fact, the California system peak from 1990-1999 grew less than 2% per year (to about 50,000 MW, with 41,000 MW representing total demand on the three large investor-owned systems)." PC 109 at 4. NRDC also stated that the "[t]otal statewide consumption of electricity increased less than 1% per year from 1990-1998 (less than one third the rate of the 1980s)." PC 109 at 4. Recent data shows that hotter weather greatly affected a significant short-term increase in consumption for the first six months of 2000. PC 109 at 4.

NRDC largely attributed higher prices in California over this past summer to weather

and higher wholesale electricity prices:

> Electricity use spiked in June 2000, up almost 13% compared to much cooler June of a year earlier. This clearly contributed to sharply higher wholesale electricity prices for June 2000, which averaged about twelve cents per [kWh] (a sixfold increase over the June 1999 figure). It didn't help, obviously, that natural gas prices also were soaring above five dollars per [mmBtu] (if sustained, this would drive the fuel costs alone for older gas-fired power plants past five cents per kWh produced). The first three weeks of July saw more moderate weather in California, and both electricity and peak consumption were down compared to the same period a year earlier; average wholesale electricity prices dropped about 40%. However, at more than seven cents per kWh, these prices were still very high by recent historical standards, and more unpleasant suprises are entirely possible in the months ahead. PC 109 at 4.

NRDC also specifically pointed to the significant curtailment of hydroelectric power throughout the Pacific Northwest. Tr.2 at 64. "Essentially, rainfall across the Sierra Nevadas, the Cascade, was much lower and was actually near historic low, so much of that generation capacity was reduced, and in many cases there were no constraints in the system that prevented exports into California." Tr.2 at 65.

NRDC stated:

> The short term reliability crisis in California should be quickly and cost-effectively resolved by additional investment and deployment of energy efficiency and renewable energy on sufficiently large scale, alongside entry into service of single and combined cycle natural gas-fired combustion turbines already in the siting and construction process (more than 3500 MW already having completed the siting process).
>
> The deployment of energy efficiency and renewable energy investments has already made significant contributions to California's economy and electricity grid. California's efficiency programs and standards have reduced peak electricity demand by 10,000 MW and total annual consumption has been reduced by approximately 15%. Since 1990, energy efficiency investments have reduced statewide electric bills by more than $2.8 billion. As a result, 'California continues to lead the nation in maximizing the amount of Gross State Product produced per unit of energy' . . . . California still has numerous untapped and inexpensive opportunities to get more work out of less electricity.
>
> Renewable energy is also a critical part of California's energy portfolio, with about one-ninth of the state's supply now generated from wind, solar, geothermal or biomass resources. Thanks to a 1998 auction for new renewable

> capacity, more than 500 MW of urgently needed supply are now being added to the California system, with almost 100 MW already installed, more than 400 MW expected by the end of 2001, and at least 900 additional MW available for near-term purchase. The new capacity has gratifyingly short lead-times, with the 50 winning bidders all scheduled to be operating by summer of 2002. PC 109 at 4-5.

NRDC testified that the California market is still in transition. Tr.2 at 66. Some market mechanisms will not completely convert for several years, resulting in price spikes and dislocations in the market-based system. Tr.2 at 66. However, NRDC does not believe that the system is fundamentally wrong. Tr.2 at 66. It predicts the system will improve, and is an example of what may or may not be the most useful tools in deregulation. Tr.2 at 66-67.

b. Deregulation in New England. According to Mr. Silva of NRDC, the energy "Oklahoma land rush" phenomenon being seen now in Illinois "has also already played itself out in New England, where energy markets were deregulated earlier than Illinois." PC 109 at 3. NRDC gave a detailed account of what happened when New England underwent deregulation:

> By early 1999 some 63 electric generating projects were proposed in New England, totaling 31,000 MW of generating capacity, of which between 7,000 and 8,000 MW are expected to actually be built . . . . By way of comparison, the current annual peak demand in New England is approximately 22,544 MW with the New England Independent System Operator . . . calculating that an additional 4,000 MW of generating capacity is all that is required to meet short term expected increases in electrical demand.
>
> The 31,000 MW of generating capacity originally proposed in New England was winnowed down to approximately 9,437 MW by power plant siting authorities and environmental regulatory agencies in Massachusetts, Maine, New Hampshire, Connecticut, and Rhode Island. Most relevant is that of the 36 combustion turbines being permitted at 19 electric generating facilities across New England, all are combined cycle natural gas-fired combustion turbines . . . . These combustion turbines are expected to operate as intermediate load following or base load units, rather than peaking units.
>
> In the neighboring state of New York, 20 new electric generating facilities are undergoing siting review representing a total of 15,064 MW of generating capacity[.] [A]vailable information indicates they will be equipped with combined cycle combustion turbines. PC 109 at 3-4.

NRDC believes that "[p]art of the reason [that New England chose combined cycle plants] was the attraction for mainly the host communities . . . in having units that had a clear

value, and in terms of benefits to the community and the state, there was a definite need and recognition of the need for additional capacity." Tr.2 at 58-59. The combined cycle plants also met stringent air and water requirements. Tr.2 at 58.

3. Illinois Takes Steps Toward Deregulation

Illinois approached deregulation differently than California. Tr.1 at 35. As Mr. Udo A. Heinze, on behalf of Ameren, stated: "Illinois has chosen a market-based approach to achieve the appropriate supply/demand balance." PC 107 at 13. However, according to Mr. Elam of American Energy, both Illinois and California are deregulated at a level of two out of ten, because both currently lack competition. Tr.1 at 836-837.

The Illinois General Assembly passed the Electric Service Customer Choice and Rate Relief Law of 1997 (Illinois Electricity Choice Law) to meet this end. ComEd Exh. 1 at 7; see 220 ILCS 5/16-101 through 16-130 (1998). Executive Director Fisher of the ICC stated that the law partially was "intended to spur innovation and drive down prices through competition among Illinois' traditional utilities and to attract new competitive power suppliers to the state." Tr.1 at 23; see also 385-86. According to MWIPS, increased competition in the wholesale market will reduce the probability of price spikes in the Midwest market. Tr.1 at 326-327. IEA commented that Illinois, which is the only state in our area undertaking deregulation, is "leading the way in creating a competitive electricity market that will result in more affordable electricity prices for our citizens." PC 167 at 5.

ComEd stated that by "May 2002, all customers can select their own vendor of electric power." ComEd Exh. 1 at 7. As of October 1, 1999, approximately 52% of ComEd's non-residential customers had the opportunity to choose their own electric provider. Tr.1 at 299. "Forty percent of the eligible [kWh] are already operating under non-traditional supply." Tr.1 at 299. However, electric utilities must still provide power to customers in their service territories, even if they select a different vendor. The ICC continues to regulate the utility's rates and delivery services. ComEd Exh. 1 at 7.

Under the Illinois Electricity Choice Law, the ICC no longer can order utilities to build new electric plants. ComEd Exh. 1 at 7. Instead, the construction of new generators is now market driven, relying on the increased demand for power to spur new growth and decreased demand to stop unnecessary construction. ComEd Exh. 1 at 7-8. Private investors, rather than utilities and customers, bear the financial risk of building new plants. ComEd Exh. 1 at 8; Tr.1 at 326. Further, the ICC no longer examines the need for new projects. ComEd Exh. 1 at 8. Executive Director Fisher testified on the ICC's former statutory role in determining the State's energy needs:

> The [ICC] prior to the '97 restructuring law had a formal responsibility to have filed by each individual utility what was called a least cost of planning, and basically it was a 20-year forecast of power demand.

> The '97 law took away that requirement from – from the utilities and, therefore, there is not a formal role for the [ICC] at this point in terms of the overall – looking at the overall generation. Tr.1 at 32.

As Executive Director Fisher explained, the Illinois Electricity Choice Law also froze electric base rates for customers at 1996 prices until 2004. The rate freeze allows for a smoother transition for deregulating Illinois electric utilities. Since 1996, national and Midwest wholesale electric prices have risen and are anticipated to continue climbing if the supply for power does not match national demand figures. Tr.1 at 28-29.

The ICC suspects that between the years of 2004 and 2005, Illinois utilities will request rate adjustments to reflect the change in the price of wholesale power. Executive Director Fisher said that the electric rates, primarily for the delivery of power, are "simply a function of supply and demand." Tr.1 at 34. The ICC stated that, with the current rise in wholesale prices, if Illinois utilities today could request increased rates, they would have strong arguments to raise the prices of retail power in Illinois. Tr.1 at 29, 34. ComEd noted that the rate release would differ from what happened in California because utilities would have to petition the ICC to abandon customers and place them on the spot market. Tr.1 at 305.

C. Environmental Effects of Deregulation

Ms. Stark, Director of CARE, as well as other citizens, voiced concerns that "virtually no rules or regulations exist because these [peaker] plants are so new." Tr.1 at 647. However, private companies and public utilities are still subject to environmental standards and local zoning ordinances. ComEd Exh. 1 at 8. Facilities must obtain air emissions permits and possibly water discharge permits from IEPA to construct and operate peaker plants. Tr.1 at 53. IEPA permits can restrict a facility's hours of operation. Tr.1 at 312; PC 9 at 6. IEPA can also impose monitoring and testing provisions in the permits to ensure that peaker plants do not exceed emission limits. Tr.1 at 312. If an applicant cannot prove compliance or will not remedy the problem, IEPA denies the permit. Tr.1 at 53.

Indeck testified that it analyzed some other Illinois industrial facilities under standard industrial classification (SIC) codes, which IEPA uses in part to set emission standards. Tr.1 at 247. The company compared NO_x emissions to steelworks, refineries, industrial machinery manufacturers, brick and tile manufacturers, and other operations in Illinois, and testified that peaker plant emissions are in the middle of approximately 200 other sources. Tr.1 at 248-249. Because peaker plants fell in the middle of the spectrum, Indeck stated the electric plants should not be more heavily regulated than other forms of industry. Tr.1 at 252. "[A]ny change in regulatory philosophy should apply to all industry, not just to peaker plants." Tr.1 at 254.

D. Impact of Deregulation on Local Zoning

Deregulation shifted the statewide burden of siting largely onto local municipalities. Before 1997, the ICC controlled siting of new generators, requiring all utilities to receive a certificate of public convenience and necessity. Tr.1 at 436. "Utilities seeking a certificate of public convenience and necessity for a new plant were required to demonstrate an economic need for additional generating capacity." ICC Exh. 1 at 5. The ICC granted certificates when a "new plant was necessary to provide adequate, efficient, and reliable service at the least cost." ComEd Exh. 1 at 8. According to Ms. Turnball, a citizens group consultant, the ICC directed utilities to provide an environmental impact assessment and held public hearings to determine if there were better ways to produce power. Tr.1 at 436.

The ICC certified nine investor-owned companies as electric utilities, including ComEd, Ameren, Illinois Power Company, and Certified Central Illinois Light Company. Tr.1 at 19-20; ICC Exh. 1 at 2. ComEd stated that "[l]ocal input was limited because a state Certificate of Public Convenience and Necessity generally preempts local ordinances such as zoning . . . . [R]egional public utility power plants and transmission lines are considered matters of statewide, not local interest." ComEd Exh. 1 at 8.

When Illinois restructured the electric industry in 1997, the ICC could no longer order companies to construct new plants to meet the State's demand for electric power. ICC Exh. 1 at 5. However, Executive Diector Fisher of the ICC stated that "the provisions of Illinois law addressing siting of electric generating facilities have not changed." ICC Exh. 1 at 5. Non-utility generators have and continue to be exempt from the ICC siting process. The major shift was in the trend towards building non-utility plants to meet peak demand for power. In response to deregulation, numerous IPPs applied to construct non-utility generating plants in Illinois. Because State and federal changes made non-utility generation economically attractive, especially over short distances, a higher number of non-utilities have begun to propose new generation facilities in Illinois. ICC Exh. 1 at 5.

Because the market now favors building non-utility plants, the burden of locating the generators falls on local counties and municipalities. The municipalities mainly rely on zoning and other land use regulations to site new plants. ComEd Exh. 1 at 8; PC 107 at 6; Tr.1 at 868. According to Indeck, siting, certain wastewater approval, water supply approval, and ultimately a building permit are now solely addressed at the local level. Tr.1 at 246.

Many citizen groups and government officials challenged whether local zoning could provide sufficient balance in evaluating whether to site peaker plants. NRDC commented that "residents of many potential host communities are convinced from their experiences that existing local zoning requirements are not adequate to address all the public interest concerns associated with [peaker plants]." PC 109 at 7. NRDC expressed concern that Illinois will develop into a:

> Balkanized area where some communities are more willing or tolerant to accept these projects, others will fight them at any cost regardless of the actual value or how meritorious future projects may be, and we're talking both about natural gas combustion turbine units and renewable projects. Tr.2 at 63.

LCCA also commented that "[l]ocal zoning does not adequately address siting considerations." Tr.1 at 460. State Representative Mary Lou Cowlishaw stated that "[a]s government seeks to restore a free marketplace, some anticipated problems are almost unavoidable. Peaker power plants and the siting of them are just such a problem." Tr.1 at 386.

Citizens expressed concern that "[p]eakers were not anticipated by the existing zoning courts." Tr.1 at 940. "Local governments have not had adequate time to respond to the zoning implications or peaker plant constructions." Tr.1 at 389. Mayor Vivian Lund of Warrenville testified that "[t]ime should be afforded local governments to revise their local zoning ordinances to assure fair and adequate review of these facilities which, because of their multiple impacts upon local and regional . . . should be considered special uses." Tr.1 at 389-390. Mr. Sargis, an attorney with experience in land use and zoning law, commented that local ordinances, sometimes like environmental regulations, often lag behind development trends. Tr.1 at 1,021. Municipalities continually add categories to reflect the new developments. Tr.1 at 1,021. Mr. Sargis stated:

> [I]n many cases, a local zoning ordinance today might allow public utility as a permitted use in many districts. And a peaker plant in the absence of an updated code provision could be interpreted to be a "public utility" under the local definition. In that instance, a peaker plant could ostensibly pass local zoning approval without meeting any of the procedural safety guards such [as] public notice and public hearings that otherwise would apply for special or conditional uses. It wouldn't matter if there was a guidance that was available if the local code essentially allowed that use as a permitted use. Tr.1 at 1,021-1,022.

Ms. Turnball also stated that "siting is impacting most municipalities who have zoning ordinances that wouldn't have included a category for that particular business because even though there might be a statement in the zoning ordinance that says public utility station, they aren't a public utility." Tr.1 at 436-437. She maintained that the ordinances are not geared towards siting peaker plants. Tr.1 at 436-437.

Mr. Eaton testified that "different zoning agencies have varying degrees of expertise and ability to step into the fray and handle these inquiries." Tr.1 at 868. Mr. Sargis stated that "many communities, both government and the public, are ill-equipped to evaluate the potential impact of facilities that are not yet familiar in Illinois." Tr.1 at 1,021. Ms. Zingle, who is a member of the Lake County Board of Appeals, strongly agreed that zoning is a local issue, but "adamantly disagreed with Director Skinner's optimism . . . about the ability of

local villages to cope with the host of issues surrounding [peaker] plants." Tr.1 at 511. She stated that, "[w]ith the best of intentions, [local governments] don't have a clue what questions to ask and they don't know how to judge the answers they get of the questions they do ask." Tr.1 at 511.

Mr. Ersel C. Schuster, Supervisor of Seneca Township and member of the McHenry County Board, felt that "[l]ocal officials are the 'front line;' those expected to address concerns over the operation of such facilities." PC 186 at 1. He commented that, "as is often the case, we neither have the authority, technical expertise, nor the financial ability to ensure that the operator is in compliance with the regulations." PC 186 at 1.

Ms. Chris Geiselhart, Chairperson of Concerned Citizens of Lake County (CCLC), complimented the Village of Libertyville for creating a system to hear testimony. There, she noted, "people have spent hundreds of hours and thousands of dollars educating themselves and the plan commission . . . through public testimony and hiring expert witnesses to testify in opposition, finally, to Indeck experts." Tr.1 at 916. She asked "how can many communities of more limited wealth and means expect to raise the kind of public outcry and money for expert witnesses that Libertyville did? How many zoning boards have the expertise needed to make the best decision for their communities?" Tr.1 at 916-917. Ms. Johnson, a resident of Marengo and Vice Chair of the Rural and City Preservation Association, testified about the siting of the PP & L Global plant:

> Those hearings and meetings keep coming week after week after week. We just keep going to hearings. The county can't afford experts to help them. Our group can't afford experts to push them and urge them to make some zoning ordinance and strong standards which would protect us. Our lives have been totally disrupted, and meanwhile, we realize the County Board is being lobbied by people in the county who would prefer to have a peaker plant put out in the country, meaning South Marengo. Tr.1 at 551.

Several citizens testified about the cost of challenging the siting of peaker plants. Ms. Zingle of LCCA pointed out that their fight was only with what they considered to be badly sited plants. Tr.1 at 521. Ms. Zingle voiced frustration about money spent by both citizens and municipalities to challenge peaker plants:

> Opponents for the plant in Woodstock raised over $100,000 in their fight. Libertyville opponents reportedly spent over $500,000 for those 20 public hearings with the consultants and the attorneys. Individuals in Aurora have discussed with me possibly taking out second mortgages on their home to pay for the lawsuit. Bartlett, which will come later, has two attorneys and a range of consultants. Zion opponents just hired a municipal attorney in addition to the attorney and the environmental consultant we already have on board . . . . The villages that spend money get the results. Villages like Lockport who simply try

to rely on the system do not. It creates a terrible disadvantage for the affluent cities and for the less aggressive. Tr.1 at 520-521.

Citizens asserted that problems with siting are exacerbated by the fact that IPPs are suing municipalities for choosing not to site a generator. After McHenry conducted several months of hearings and voted against siting an Indeck peak generating facility in its area, Indeck filed a lawsuit challenging McHenry's decision. Tr.1 at 550 (Johnson), 972 (Wilson).

NRDC commented on the "growing sense of unease in Illinois that current state and municipal review of new or expanding electric generating facilities is too limited and inadequate." PC 109 at 7. NRDC stated that the sentiment "may be in part attributable to the lack of coordination between municipalities and Illinois regulatory agencies involved in permitting new electric generating facilities, particularly [IEPA] charged with evaluating the air and water quality impacts of these facilities." PC 109 at 7.

Executive Director Fisher of the ICC explained that some states have taken approaches to siting similar to that of Illinois. Others have established state siting committees either as part of or separate from state public utility commissions. PC 8 at 2-3. Like Illinois, California, New York, and Ohio have enacted electric restructuring laws. Unlike Illinois, these states use state siting committees to determine where peaker plants should be sited. Texas also has enacted an electric restructuring law. It has a system similar to the current system in Illinois: local zoning boards control siting, and the state environmental agency controls permitting. PC 8 at 2-3.

Wisconsin, which has not enacted an electric restructuring law, requires traditional certificates of convenience and necessity for peaker plants. Kentucky, which also has not enacted an electric restructuring law, does not require any approvals, other than state environmental permitting and local zoning, as long as the peaker plant sells the electricity it generates wholesale on the market. PC 8 at 2-3.

E. Current and Future Retail and Wholesale Energy Markets

Mr. Elam of American Energy provided a broad overview of the role of peaker plants in the energy market. Lake County Exh. 4. Electric power is currently sold in both the wholesale and retail markets. Different rules govern each market. The "wholesale market acts much like a free market, while the retail market is still very regulated." Lake County Exh. 4 at 3. Mr. Elam asserted that, in the future, both the wholesale and retail markets will converge into a single energy market. Tr.1 at 804.

1. Retail Market for Electric Power

Mr. Elam stated that the deregulation of the Illinois electric industry is actually closer to re-regulation of the market. Lake County Exh. 4 at 3. "[I]nvestor owned utilities have

been given a subsidy called stranded cost to help them transition into a competitive market." Lake County Exh. 4 at 3. Stranded costs are also called the competitive transition charge. Lake County Exh. 4 at 3.

When the retail market is completely deregulated, customers will either remain "firm customers" or will opt to contract for varying degrees of interruptible loads. Lake County Exh. 4 at 3-4. Firm customers "continue to demand firm reliable service, and they will pay for it." Lake County Exh. 4 at 3. Other companies will be "willing to modify their operations to gain a break in price." Lake County Exh. 4 at 3-4. Mr. Elam stated that the "combination of these firm and interruptible loads all will become a part of a suppliers portfolio thus another means for reserve margins to be enhanced." Lake County Exh. 4 at 4.

2. Wholesale Market for Electric Power

Mr. Elam asserted that the wholesale market for electric power is very effective. Tr.1 at 837. "Wholesale market prices are driven by supply and demand, which is influenced by weather, fuel prices, and future expectations." Lake County Exh. 4 at 4. Wholesale electric power is traded like a commodity. Independent brokers conduct transactions between utilities and marketers on a brokers market. Independent brokers trade 50-MW blocks of power, which are delivered or priced into a hub, such as the CINergy transmission system. Someone can buy and sell the same power several times in the same day. Supply and demand dictate how prices move. For example, a peaker plant in Chicago will either sell its energy to the CINergy market or into the Chicago market, depending on which offers the highest price. Lake County Exh. 4 at 4.

According to Mr. Elam, "[m]arketers sell various products into the market." Lake County Exh. 4 at 5. "The standard product is a sale of 50 [MW] for each hour for one 16 hour day, during the on-peak hours of 0700 - 2300 hours. The price reflects the anticipated average price per [MW] hour over the 16-hour period." Lake County Exh. 4 at 5.

Mr. Elam explained that marketers create a spread or profit from either selling short or long on transactions and filling their trade. Lake County Exh. 4 at 5. "Buying and selling blocks of power is often known as swaps." Lake County Exh. 4 at 5. Marketers sell short by selling power, and filling their position by buying the same contract back at a lesser price. In contrast, they buy long if they wait to sell a contract for power or generation that they have or own. Marketers buy long when they expect prices to rise and buy short when they anticipate prices will drop to cover their position. Lake County Exh. 4 at 5.

Mr. Elam stated that marketers can also buy options, which give purchasers the right, without the obligation, to "call on power at a specific . . . price, terms and conditions." Lake County Exh. 4 at 5. The buyer of an option gives a premium to the seller of the option. Lake County Exh. 4 at 5. This is analogous to paying premiums to a homeowner's insurance company to cover potential damages from a fire. Lake County Exh. 4 at 5-6.

Mr. Elam noted that having an option can be better than selling long on energy. Lake County Exh. 4 at 6. Companies that own energy contracts and sell long must either sell their position before the trade period closes or settle out with liquidated damages. Companies owning an option on power "will only call on that power if the market price is high enough to generate a profit." Lake County Exh. 4 at 6. "Owning a peaker plant is very much like owning an option, the owner does not have to run it." Lake County Exh. 4 at 6. The owner can sell a "call option" and use its generators to "back the option sale." Lake County Exh. 4 at 6.

Mr. Elam briefly summarized the price structure for peaker plants:

> The peaking facility has basically two cost components, a fixed and variable price. The fixed price that an owner of a peaking facility has to pay is made up mostly of the debt service that is used to pay for the project cost of the facility. The variable portions of the price of power are based on the variable cost of fuel and some operations and maintenance costs. The fuel portion is based on the heating value or efficiency of the gas turbine. Depending on the heating value and the delivered price of fuel, the variable cost of energy may range from $35-60/[MWh]. It should be noted that in addition to buying options on energy (calls or puts), marketers and utilities use the natural gas futures market to hedge their price risk. Lake County Exh. 4 at 6.

Mr. Elam stated that because the same energy contracts are sold many times, selling rights to a peaker plant does not even imply where its power will be sold. Lake County Exh. 4 at 6-7. Power from peaker plants can be exported "several states away" because the plants are used when market prices are highest. Lake County Exh. 4 at 7. Transmission tariffs are "extremely small when compared to the price paid for power during peak periods." Lake County Exh. 4 at 7. For example, a peaker plant in Lake County selling power at $1,000 per MWh can move power to CINergy for a maximum cost of $6 to $12 per MWh. Lake County Exh. 4 at 7.

Mr. Elam explained that "[m]oving power over several transmission systems is not a problem <u>if the transmission system is reliable</u>." Lake County Exh. 4 at 7. Price is generally not the problem during peak hours. Lake County Exh. 4 at 7. "Likewise, high fuel prices do not hinder the sale in volatile markets." Lake County Exh. 4 at 7. Owners of generation have no means to guarantee that their power will benefit local communities. Lake County Exh. 4 at 8. Mr. Elam asserted that, "[i]n reality, the generation being built will be used to provide a hedge for the marketer or utility selling into a hub or specific market such as Wisconsin." Lake County Exh. 4 at 8.

3. <u>Price Spikes</u>

According to Mr. Elam, to understand why the 1998 price spikes occurred in the electric power market, "it is helpful to have a historic perspective as well as a futuristic viewpoint." Lake County Exh. 4 at 9. As stated above, the electric power market changed dramatically between 1992 and 1999. The "change created the foundation for the electric industry to move towards competition and accept market rates." Lake County Exh. 4 at 10. Mr. Elam explained that marketers purchased electric power as a "firm" product, which "means that any components necessary to generate and deliver the commodity to the delivery point is included in the price." Lake County Exh. 4 at 10. "The fillcost of energy is priced in a total dollar per [MWh] fee, with the capacity component embedded into the unit price." Lake County Exh. 4 at 10.

Mr. Elam stated that, by 1998, the electric market split into the segments of (1) trading and (2) "trading to fill." Trading is where marketers and utilities broker power as a commodity. Lake County Exh. 4 at 10. "The trades are made in standard 50 MW blocks under standard terms and conditions." Lake County Exh. 4 at 10. Trading generally uses a hub like CINergy as a pricing point. Lake County Exh. 4 at 10. It does not matter to marketers where the power is generated as long as they generate a profit from the delivery price to the hub. Lake County Exh. 4 at 10. Mr. Elam explained that "[t]rading to fill means that the marketer or utility is buying or selling for a specific need." Lake County Exh. 4 at 10. Utilities only purchase the MW needed to meet requirements for specific hours. Lake County Exh. 4 at 10-11.

Mr. Elam stated that the 1998 price spike occurred when a marketer, Federal Energy, sold electric power it did not have and could not pay for on the market. The marketer "shorted the market" by selling 750 to 1,000 MW "to various parties and did not have the physical power or own contracts to cover its position." Lake County Exh. 4 at 11. Mr. Elam noted that the hollow sale "gave the Midwest market a false sense of security." Lake County Exh. 4 at 11. The market only realized the shortcoming when Federal Energy could not buy back the power at the end of the trading session. Lake County Exh. 4 at 12. The false bid to sell power increased the demand for electricity. Prices soared to over $10,000 per MWh because of the need for the missing supply, according to Mr. Elam. Lake County Exh. 4 at 11.

Mr. Elam explained that immediately after the 1998 Federal Energy shortfall, "monthly prices for the summer soared to more than $200 per [MWh] for the on-peak periods. Since that time prices have dropped dramatically, but not back to the pre June 1998 levels." Lake County Exh. 4 at 11-12.

Mr. Elam stated that the 1998 price spikes "were a function of supply and demand." Lake County Exh. 4 at 12. "FERC's review of the matter concluded that the wholesale market worked to correct itself." Lake County Exh. 4 at 12. According to Mr. Elam, although owners of peaker plants can hedge their portfolio, it does not "assure the local ratepayers or customers that there will be no more price spikes." Lake County Exh. 4 at 12.

F. Supply and Demand for Electric Power

NRDC stated that the deregulation of the electric industry and the considerable increase in demand for power have contributed to the proliferation of peaker plants in Northeastern Illinois. Tr.1 at 385-86. According to NRDC, "the Energy Information Administration now forecasts that by 2020 there will be the need for approximately 300 gigawatts, otherwise known as 300,000 MW, of new capacity across the United States." Tr.2 at 58-59. These figures basically track future growth in the gross national product and are based upon the assumption that the economy will continue to be healthy. Tr.2 at 94. PG&E National Energy Group (PG&E) stated that "[i]t is critical that a balance be struck between the pressing need for new sources of electricity and the desire to maintain and improve environmental quality." PC 170 at 2.

According to ComEd, when evaluating current and future demand for electric power, both the constant need for power and the greatest need for power must be taken into account. ComEd asserted that utilities must be able to generate enough power to meet the greatest demand because electricity cannot be stored and must be generated at the instant it is required. PC 164 at 2; see also PC 1 at 2. The base load of power is the "lowest continuous load over the course of a year," and the peak load is the "highest load observed during a period of time." ComEd Exh. 1 at 3. ComEd stated that peak demand depends highly on weather conditions. Tr.1 at 297. For example, the amount of people that ComEd serves varies considerably when measured daily and annually. ComEd Exh. 1 at 3.

ComEd experiences highest peak-load use in summers because people heavily use air conditioners. According to Ms. Juracek of ComEd, "[a]bout 40% of the peak load is from residential air conditioners." Tr.1 at 297. "ComEd's all-time summer peak load was 21,243 MW on July 30, 1999, between 2:00 and 3:00 p.m." ComEd Exh. 1 at 3. By contrast, ComEd's winter all-time peak load was 14,484 MW in late afternoon on December 20, 1999. ComEd Exh. 1 at 3. Although ComEd may use peaker plants in the spring or fall when it undergoes maintenance on its base-load plants, intermediate capacity is generally enough to cover the need in non-summer months, according to ComEd. Tr.1 at 302.

ComEd also testified that the technical revolution of the 1990s is influencing the demand growth in its area. Tr.1 at 298; see also Tr.1 at 619. Executive Director Fisher of the ICC testified that the "remarkable economic expansion of the past several years, coupled with the proliferation of electronic devices in our homes and offices, has increased the overall demand for electricity." Tr.1 at 23. ComEd stated that additional computers cause further air-conditioning loads and the Internet is affecting loads in hotels. Ms. Juracek of ComEd testified that ComEd is "seeing loading on the order of 150 watts per square foot in a building." Tr.1 at 298. ComEd testified that "this is ten times the type of load . . . seen in the past." Tr.1 at 298. Reliant stated that ComEd faced an annual 3% increase in demand for electricity. PC 1 at 2.

The rise in demand is being felt on a national level. According to Reliant, the United States Department of Energy marked a 17% increase in electricity demand in the past decade. However, the construction of new plants has increased by less than 1%. PC 1 at 2, 12. In a report following price spikes in the summer of 1998, FERC stated that the 1990s demand for electric power in the Midwest grew at a faster rate than that of the nation, and much faster than the rate on the coasts. Tr.1 at 35-36. IEA testified that peak loads grew 4.2% between 1994 and 1999. Tr.2 at 37. According to PG&E, past investments are not keeping pace with regional demand. PC 170 at 2.

According to Executive Director Fisher of the ICC, "[w]hile baseload capacity remains adequate to meet base demand, peaking capacity has not expanded to keep up with increasing peak demand." Tr.1 at 23-24. For example, on July 30, 1999, ComEd set a new peak demand of 21,243 MW. One MW generally serves 500 homes with electric power at times of peak demand. This marked a 10% change in peak demand over one year. Usually, changes in peak demand amount to 1/2 to 1%. Tr.1 at 24, 298. Utilities and IPPs stated that the best way to encourage additional plant development to meet the growing peak demand is through the free market that the Illinois Electricity Choice Law established. PC 170 at 2.

Dr. Thomas Overbye, Associate Professor, Department of Electrical and Computer Engineering, University of Illinois, Champaign-Urbana, stated that the load for ComEd is increasing at the rate of approximately 350 MW per year of demand. Tr.1 at 605. According to Dr. Overbye, this places the load growth for ComEd at 1.5%. This is "how much new generation is needed to meet [its] increase in load." Tr.1 at 605. The Illinois Municipal Electric Agency (IMEA), which is "a not-for-profit unit of municipal government, made up of 39 of the State's 42 municipally-operated electric systems," has seen a 33% increase in peak load over the last decade, from 300 to 400 MW. PC 110 at 1. IMEA stated that, "[a]t this time, IMEA has contracts with 28 of the State's 42 municipal systems to provide all, or most, of [its] wholesale electricity." PC 110 at 1.

The ICC noted that the Midwest experienced very warm summers in 1998 and 1999. Tr.1 at 24. Before 1999, the last peak by ComEd was set in 1995. Tr.1 at 605. The extreme heat caused utilities throughout the region to pay very high prices for wholesale power on peak demand days. Tr.1 at 24. Executive Director Fisher stated that "[t]hose prices attract new peaker plant development." Tr.1 at 24.

According to ComEd, it uses different types of generators to satisfy the base-load and peak-load demand for power. ComEd Exh. 1 at 3-4. Base-load generators, which basically operate year round, usually have relatively high fixed costs and low operating costs. ComEd Exh. 1 at 4; PC 1 at 3. The generators are generally nuclear plants or efficient coal-fired boilers. Tr.1 at 72, 224. Installing a base-load plant that can annually produce 21,243 MW of electricity is costly and inefficient "because that peak amount of demand is only present for one hour of the year." ComEd Exh. 1 at 4.

Mr. Romaine of IEPA explained that cyclic or intermediate power plants "operate on a daily cycle, tracking the daily cycle of power demand as it rises and falls during the day." Tr.1 at 72; PC 1 at 2. According to IEPA, this category includes "some of the older plants and some of the plants specifically designed to interpret the steam and boiler plants." Tr.1 at 72. IEPA stated that, together, base-load and intermediate power plants "cover most of the daily and seasonal fluctuations in demand." PC 1 at 2.

ComEd noted that, in contrast to base-load or cyclic facilities, peaker plants are "designed to produce power only during times of heavy demand, ranging from seasonal to hourly." ComEd Exh. 1 at 4. Peaker plants can quickly start up and shut down to best respond to the heightened demand for power. According to Mr. Romaine, they are "the most expensive to operate because they use high cost natural gas [and] light oil [as fuel]." Tr.1 at 73. However, peaker plants can economically supply peak-load power despite higher hourly operating costs because they have lower capital costs than base-load plants. ComEd Exh. 1 at 4. ComEd uses a combination of both its own and independent generators to meet summer peak-load demands. ComEd Exh. 1 at 4. Ameren stated that it predominately provides electricity to meet base demand and that it is currently in the process of constructing six new peaker plants with a total maximum capacity of 560 MW to supplement its plants in Central and Southern Illinois. Tr.1 at 340, 353.

ComEd testified that it currently owns and operates five nuclear power plants that can produce 9,500 MW of power. ComEd Exh. 1 at 4. The ICC reported that no new coal or nuclear plants are currently under construction in Illinois. Tr.1 at 40. According to the ICC, two ComEd nuclear power plants in Zion and one ComEd nuclear power plant in Dresden are closed. Two other ComEd nuclear power plants in Dreseden are scheduled to go off-line in 2009 and 2011. PC 8 at 1. ComEd and Amergen plan to shut down another nine nuclear power plants by 2027. PC 8 at 1.

The ICC stated that, due to the closure of nuclear power plants, Illinois utilities imported substantial amounts of power in 1999. However, "that is not the case today." Tr.1 at 36. According to Executive Director Fisher, both the Midwest and Illinois have had a lot of excess power in the reserves over the summer of 2000 because of the mild season. Tr.1 at 36-37. It should be noted that, even with the mild summer in 2000 and the general reserves, ComEd testified that it came within 1,000 MW of the all-time peak load of 21,000 MW about one week before the August 24, 2000 hearing. Tr.1 at 299-300.

ComEd and Reliant also noted that they view peaker plants as an insurance policy when something goes wrong with a base-load generator. Tr.1 at 302-03; PC 1 at 10. According to Ms. Juracek of ComEd, if harsh winter conditions prevent the transport or use of coal, peaker plants could quickly satisfy the temporary demand for electric power until the base-load plants can operate again. Tr.1 at 302-03. ComEd views this as a matter of public safety. Tr.1 at 303.

Mr. Eaton, an attorney for the Liberty Prairie Conservancy, Prairie Holdings Corporation, and the Prairie Crossing Homeowners Association, warned:

> It is probable that this rush to build and begin operating new sources is a short window, that the demand will be short lived . . . . [S]ome probable combination of new base-load plants, coupled with such things as microturbines and other sorts of distributed generation, [will] come increasingly into the marketplace in the next very few years, significantly and adversely impacting the demand for peaker plants. Tr.1 at 875.

Mr. Eaton testified that many of the peaker plants under construction could ultimately be abandoned as white elephants, "particularly those which cannot or are not, for whatever reason, expanded into base-load plants." Tr.1 at 875-876.

Dr. Overbye stated that "[w]hen you're planning a power system, you have to plan for the unexpected." Tr.1 at 605. To do that, generators keep a reserve known as the capacity margin. The capacity margin provides generators with insurance in case of a hot summer or other negative weather conditions. According to Dr. Overbye, the capacity margin is "the net capacity resources minus your internal demand divided by your capacity resources." Tr.1 at 605. "Capacity resources" is the amount of generation in a region. Tr.1 at 605. It "can also include imports of power that are guaranteed from other regions." Tr.1 at 605-606. Dr. Overbye explained that the net internal demand is the amount of power people use and the estimated amount that they will use, reduced by the fact that the utility that contracts with a load, at its discretion, can turn off its power. Tr.1 at 606.

Figures for supply and demand in Illinois are currently available through a regional organization called MAIN. MAIN is primarily funded and operated by utilities, managing the flow of power in midwestern states on a daily and long-term basis. It is comprised of 45 members, including utilities, IPPs, and municipal systems. Tr.1 at 321-322. As MAIN explained, it "is one of ten regional reliability councils which comprise the North American Electric Reliability Council . . . ." MAIN Exh. 1 at 1.

According to MAIN, because individual states are a part of an interconnected system, the regional councils jointly "coordinate the planning and operation of the North American bulk electric system (generation and high voltage transmission)." MAIN Exh. 1 at 1. MAIN monitors Illinois, Eastern Wisconsin, Eastern Missouri, Eastern Iowa, part of Minnesota, and the Upper Peninsula of Michigan. MAIN Exh. 1 at 1. MAIN stated that Illinois cannot be evaluated individually because it is "part of an interconnected system of transmission and generation which stretches from the Rocky Mountains to the Atlantic Ocean." Tr.1 at 315-16.

MAIN evaluates resource adequacy for the region and compiles annual forecasts from member utilities. Tr.1 at 603; MAIN Exh. 1 at 1. MAIN stated that it "performs detailed annual studies to determine the amount of reserve required to meet a one-day-in-ten-years loss

of load probability criterion which is a widely used standard in the industry." MAIN Exh. 1 at 1. In a ten-year period, the load on one day will probably exceed the available resources. Tr.1 at 318. The minimum standard reserve requirement with this method is 17 to 20%. MAIN Exh. 1 at 1. MAIN summarizes its members' projected loads and capacity, calculates the reserves, and compares them against the standard. MAIN Exh. 1 at 1.

MAIN projected an 18% reserve margin for the summer of 2000, which fell within the 17 to 20% minimum standard. It projects that reserve margins for the years 2001, 2002, and 2003 will be 13%, 11%, and 10%, respectively, if no new peaker plants are built. These figures are all substantially below the 17% threshold. MAIN Exh. 1 at 1. IEA noted that the figures were based on historically average weather. Tr.2 at 37. It warned that "[e]xtremely hot weather could add an additional 2 to 3 thousand [MW] of demand next summer." Tr.2 at 39.

Reliant stated that, according to MAIN, the region requires an additional 7,900 MW of generation between 1999 and 2007 to meet peak demand. PC 1 at 11. Indeck stated that generators must add between "a thousand to 1,500 [MW] a year for the next five to seven years to maintain an adequate reserve margin." Tr.1 at 272. Dr. Overbye testified that the Wisconsin, Illinois, and Missouri region requires about 1,000 MW a year to meet the new load. Tr.1 at 604.

Reliant stated that the high reserve margin for 2000 was attributed to new peaker plants: "Figures from [MAIN], that include Illinois and nearby states, indicate that the reserve margin was 9.6% in 1998 and 7.6% in 1999." PC 1 at 2. Reliant claimed that the "dramatic drop in the reserve margin has been countered by the addition of new peaker plants operating this summer (such as the Reliant facility in Shelby County)." PC 1 at 2.

NRDC also predicted that the demand for electricity in Illinois will continue to increase. PC 109 at 2. The organization, which relied upon regional data, stated:

> The electric reliability council serving Illinois and portions of Wisconsin, MAIN, reports that projected maximum internal demand for electric generation in 2000 [will be] at 49,615 MW, approximately 3% higher than 199 projected maximum internal demand. The actual peak demand in summer 1999 was 49, 027 MW, approximately 1.8% above projections.
>
> For the summer 2000 peak demand period, MAIN projected available generating capacity at 56,523 MW, including generating capacity available from [IPPs] and limited imports. This figure includes 3,076 MW of new electric generating capacity available for dispatch, representing 11 new generating facilities, upgrades at existing generating facilities, and temporary facilities. PC 109 at 2-3.

Several members of the electric industry claimed that the only way to have sufficient supply and ensure affordable electricity prices in the near future is to build new peaker plants. PC 167 at 6; PC 1 at 2; PC 109 at 2. IEA, a trade organization representing Alliant Energy, Ameren CIPS, Ameren UE, Central Illinois Light Compnay, ComEd and other Illinois power companies, stated:

> If we act to impede the development of this new capacity, we will be placing ourselves and our fellow citizens at the mercy of forces that are beyond our control and influence. In our industry such forces usually mean the weather or equipment difficulties and we have a long history of dealing with such unknowns. However, to voluntarily disrupt our current balance between nature supply and imported power could be a recipe for the type of economic chaos seen in Southern California only a few weeks ago. PC 167 at 6-7.

Reliant stated that "[t]he construction of peaker units will help Illinois avoid supply shortage, unwanted brownouts and unreasonably high costs for consumers that now plague California." PC 1 at 4. Reliant recalled "the summer of 1998 [in Illinois] when temperatures soared and the demand for electricity threatened the state with forced rolling blackouts." PC 1 at 4.

IMEA also warned that Illinois should "do nothing to create power shortages in Illinois through new and restrictive regulation of natural gas-fired, gas turbine peaking plants." PC 110 at 2. PG&E maintained that regulations to determine the need for peaker plants can create a chilling effect and are "antithetical to the competitive principals embraced by the Illinois legislature in 1997." PC 170 at 2; see also PC 110 at 3; Tr.1 at 310. IMEA stated that Illinois needs sufficient power generation to avoid higher costs and possibly severely diminished reliability. PC 110 at 3. "Natural gas-fired peaking plants are a vital component in the State's power portfolio and their construction and operation should not be discouraged by unnecessary and burdensome new regulations." PC 110 at 3; PC 111 at 3.

According to NRDC, "[m]any developers of new electric generating facilities believe there are lucrative short-term profits to be made by siting as many peak-load serving single cycle combustion turbines as they can within the next 18-24 months, anticipating peak demand episodes similar to that experienced by Illinois in 1999." PC 109 at 2. However, NRDC pointed to conclusions of the United States Department of Energy that "those service interruptions were due to failures in the distribution system infrastructure, inadequately maintained by the incumbent electric utility, [ComEd]." PC 109 at 2. NRDC warned that siting more peaker plants within ComEd's service area "will not necessarily avoid a repetition of the 1999 electric service interruptions in metropolitan Chicago." PC 109 at 2. NRDC advised that "improvements and upgrades of the distribution system infrastructure were and remain the principal problem and need." PC 109 at 2. Although NRDC supports siting natural gas-fired combustion turbines, it believes Illinois should also concentrate on developing renewable electric generating facilities and invest in energy efficiency. PC 109 at 1.

G. The Need for Peaker Plants in Illinois

ComEd stated that "it is not clear whether all [of the proposed] additional generating capacity is needed to meet local needs . . . ." Tr.1 at 74. ComEd asserted that the free market is necessary to promote sufficient generation. ComEd contended that "[t]here is no indication that the current regulatory scheme is thrusting too much generation on Illinois." ComEd Exh. 1 at 11. ComEd encourages new IPPs, which are typically gas-fired, peak-load units, to locate in Northern Illinois. ComEd stated that this will diversify and disperse the electric supply of the region, and feels supply and demand will control the number of generation plants built in Illinois. ComEd Exh. 1 at 7-8,10. ComEd warned that "a reduction in new generation could fundamentally alter the wholesale market for electricity," and warned that the "wholesale price of electricity could increase dramatically." ComEd Exh. 1 at 11. It gave an example to illustrate its point:

> In Illinois and elsewhere, there have been wholesale price "spikes" in recent years when electrical energy has cost utilities in excess of $5 per [kWh]. (Last year, ComEd sold electric power to end users for, on average, $0.074 per [kWh].) These skyrocketing prices have occurred when very high demand was coupled with constrained generation and transmission supply. ComEd Exh. 1 at 11.

According to ComEd, California faced electric shortages from unbalanced supply and demand. ComEd stated that California differed from Illinois in that it "retains a pervasive regulatory role in evaluating and approving new generation." ComEd Exh. 1 at 12. ComEd asserted that the lack of growth of new generators in California is from the state's regulation of wholesale power, rather than letting the market drive the price for electricity. ComEd. Exh. 1 at 12. According to MWIPS, California presently has $10 billion of new generation facilities in line for construction. Tr.1 at 333. MWIPS testified that, "[a]ccording to recent statistics presented to the California governor, . . . 672 [MW] of new generation was added to the system [between 1996 and 1999]. Demand during that period jumped more than 5500 [MW]." Tr.1 at 333. ComEd said that "[t]his summer, California customers have experienced high prices and curtailments as demand approached capacity." ComEd Exh. 1 at 12; see also PC 110 at 2. According to ComEd, peaker plants protect Illinois customers by smoothing out price spikes. ComEd Exh. 1 at 12.

ComEd stated that new generation will also "increase the reliability of service overall, especially during times of high demand for electricity, by having more generation available." ComEd Exh. at 9. ComEd has also sold its own fossil-fuel power plants to Midwest Generation EME, LLC (Midwest Generation) and agreed to purchase power from the company to supply to its customers. ComEd Exh. at 9. ComEd added that new generation within its transmission "control area" eliminates potential problems when electricity is carried from a longer distance along the transmission system. ComEd Exh. at 9.

Citizens claimed that the number of proposed peaker plants far exceeds growing demand in Illinois. Citizens and members of local organizations acknowledged the need for peak-demand electric power, but challenged the need for the number of generators proposing to build peaker plants in Illinois. Tr.1 at 390, 494, 502-03, 542, 558, 701. According to IEPA, companies have submitted permit applications to operate peaker plants on 46 sites. Tr.1 at 48. Mayor Lund of Warrenville stated that "[a]lthough there is probably a need to create new supply sources to meet the demand for additional electric power during high usage periods, adequate consideration is not being given to the total amount needed for Illinois users." Tr.1 at 390.

Members of CAPPRA testified that the projected decline in reserve margins by MAIN do not include peaker plants that are accepted and approved for Illinois. Tr.1 at 494. According to CAPPRA, the additional 16,000 MW supplied by the peaker plants will almost double the 32,000 MW plant generation capacity in Illinois. Tr.1 at 495. LCCA testified that the "total power generating capability from [peaker] plants is 22,000 [MW], more than the entire ComEd system." Tr.1 at 510. The number greatly exceeds the demand for peak capacity in the area. Tr.1 at 557. According to one Illinois resident, if ComEd decides to shut down all of its coal-fired plants and solely use nuclear facilities, the proposed peaker plants would still produce excess power. Tr.1 at 558-59. Citizens worry that this surplus will be exported to other states at the expense of the surrounding local residents. Tr.1 at 390, 502-503, 542, 559.

Dr. Overbye testified that MAIN reported the generation of about 14,000 MW from new electric facilities. Tr.1 at 617. Dr. Overbye stated that, to reach the goal of 20% capacity margin, the system would need 6,000 new MW of generation. Tr.1 at 607. Dr. Overbye concluded that "we're getting quite a bit more proposed than is needed to meet the minimum requirements, the 17 to 20 percent capacity margins." Tr.1 at 607. He testified that the reserve margins are adequate and the need for new generation in the MAIN area is relatively modest. Tr.1 at 607-608.

CAPPRA also testified that excess generation also defeats programs that promote conserving energy. Tr.1 at 496. CAPPRA cited to reports by an intergovernmental international organization that stated the power generation industry is responsible for approximately 30% of national CO_2 emissions. A CAPPRA member warned that increased accumulation of CO_2 could create a greenhouse effect with several negative effects on the environment. Tr.1 at 496. According to the speaker, the intergovernmental panel included about 2,000 scientists from various nations. Tr.1 at 496.

Members of CARE also requested that consideration be given to alternative fuel resources. One of its directors testified that "[a]lternatives to natural gas should not only be investigated, but any wind or solar facilities within a 100- to 200-mile radius should be toured by these municipalities . . . ." Tr.1 at 649. IMEA stated that "it would be ideal if even

greener sources of power, such as wind, solar, or hydro, could satisfy the state's growing needs." PC 110 at 2. However, it found that "such sources of power are not available on demand and often, in peak times, are not available at all." PC 110 at 2-3.

NRDC, which promotes renewable energy resources, recommended that Illinois construct peaker plants as well as develop new renewable electric generating technologies. PC 109 at 1. It pointed out that one-ninth of Calfornia's electric supply is generated from wind, solar, geothermal or biomass resources. The new renewable capacity "has gratifyingly short lead-times, with the 50 winning bidders all scheduled to be operating by summer of 2002." PC 109 at 5.

ALAMC and IEC also testified that "[e]nergy efficiency and renewable energy sources could provide a significant portion of electrical demand in Illinois[,]" stating that:

> Encouraging the wise use of electrical power through the use of more efficient lighting, climate control and mechanical systems would negate the need for a portion of new power generation and the associated—and remove the need or remove the presence of associated air pollution, noise and water demands due to fuel combustion at electrical generators. For unavoidable growth in electrical demand, greater use should be made of nonpolluting or less polluting renewable sources of electricity . . . . Tr.2 at 111.

Ms. Skrukrud, a resident of Olin, Mills, McHenry County, likewise stated that "gas-fired plants are much cleaner than coal-fired plants, but we should not forget that there are cleaner forms of energy available such as wind, solar and the cleanest forms of all, improved efficiency in conservation." Tr.1 at 1,025.

H. Importing and Exporting Power Generated by Peaker Plants

Mr. Erjavec of Indeck stated that, "[w]ith the restructuring of the [electric] industry, the door has been opened for other retail suppliers to come into the area." Tr.1 at 274. The move towards deregulation has made it increasingly difficult to measure the amount of power imported and exported in Illinois. According to the ICC, the introduction of power marketers and IPPs entering the wholesale market adds a new layer to calculations. PC 8 at 2. ICC explained why it is difficult to determine a set amount for imports and exports:

> For example, ComEd's total sales in 1999 were about 110 million [MW] hours. ComEd purchased about 11 million, or 10% of that amount, from other utilities and power marketers. About 1 million of that was from Illinois utilities. ComEd sold about 19 [MW] hours, or 17%, to other utilities and power marketers. About 1 million [MW] hours were sold to Illinois utilities. ComEd sold the rest to power marketers or out-of-state utilities. PC 8 at 2.

The ICC stated that, once ComEd sells electricity to power marketers, it is difficult to track whether the electricity remains in Illinois. Marketers may resell power to another Illinois utility or directly to retail customers. PC 8 at 2. Out-of-state utilities may also re-sell power in Illinois or to another state. Executive Director Fisher stated that the ICC cannot track exact numbers for these transactions. Moreover, the power industry itself does not want information on how much it imports or exports to be publicly available because it gives a competitive advantage to others in the field, according to Executive Director Fisher. Tr.1 at 40-41.

Citizens expressed concern that peaker plants will export excess power to other states. Tr.1 at 390, 502-03, 542, 780, 1,024. Mr. Steve Arrigo, a member of CAPPRA, stated that "[t]he power from some of these plants far exceeds any needs in these areas and in order to sell this power, they will sell it far from here." Tr.1 at 502-503. Ms. Cole, a member of the Lake County Board, stated that "there can be no assurances that power produced in one area will be used to supply energy in that area." Tr.1 at 787. Mr. Jim LaBelle, Chairman of the Lake County Board, testified that "none of the builders and operators of power plants have guaranteed that the power produced will be used locally." Tr.1 at 780.

Mr. LaBelle stated that "the county as a whole is risking limited resources and air quality while potentially receiving no benefit." Tr.1 at 780. Ms. Cole warned that "[t]his would mean that those residents immediately impacted by the physical presence of the peaker facility would probably not garner any benefit, but instead bear the [brunt] of the adverse environmental impact." Tr.1 at 787. Similarly, Ms. Carter of the Lake County Board testified that Lake County citizens "are being asked to give up one precious natural resource with no guarantee that the sacrifice will realize a benefit for the county's citizens." Tr.1 at 799-800.

Mayor Lund of Warrenville testified that, "adequate consideration is not being given to the total amount [of power] needed for Illinois users." Tr.1 at 390. As a result, "Illinois residents will bear the negative impacts of these installments whose benefits will be sent outside Illinois borders." Tr.1 at 390.

Mr. James R. Monk, President of IEA, testified that, according to its counterparts in Wisconsin and Indiana, opponents of peaker plants argue about exporting power to other states. Tr.2 at 41. Opponents "say they're building power plants in Wisconsin to ship power to Illinois or they're building them in Indiana to ship power to Illinois." Tr.2 at 41. IEA claimed that "the basic facts of electricity and the physics of electricity are—make that difficult, especially considering the transmission constraints we have in the region." Tr.2 at 41.

Indeck also testified that it was its "expectation that the off take from any plant that [it] propose[s] in Illinois would be sold to someone who is doing retail business in Illinois." Tr.1 at 274. For example, ComEd requires a Rockford plant that Indeck owns to generate power in ComEd's control territory. Tr.1 at 274. Indeck stated that if it wanted to export power, it

would build in another area. Tr.1 at 275. Indeck claimed that long-distance transmission does not make sense because the national transmission grid was not designed for bulk transfers from one site to another. Tr.1 at 275. Reliant also commented that, "[w]hile periods of peak usage typically involve an entire region, the laws of physics dictate that [its plant in Aurora] would serve the needs of the surrounding community first and foremost." PC 1 at 11. Indeck also testified that transmission tariffs discourage exporting electricity. Tr.1 at 275-276.

According to Dr. Overbye, the problem with transporting electric power over transmission lines is that electrons do not know anything about borderlines for utilities. Tr.1 at 613. Electric power takes the path of least resistance. Tr.1 at 613. Dr. Overbye gave an example of the route electric power can take:

> Surprisingly, if Illinois sells power . . . to Tennessee, a good chunk of it [travels to] . . . northern Georgia. Another chunk of it is . . . in the Entergy region. A third of that power actually comes into TVA from the south . . . . Power loops around throughout the entire grid. Tr.1 at 613-614.

Indeck claimed that there is "probably a rare occasion where the economics might make it make sense, but by and large . . . [electric power] would go into this service territory." Tr.1 at 276. Mr. Monk of IEA testified that "geographic and transmission constraints in our region are such that it's very difficult to transmit large amounts of electricity on an export basis." Tr.2 at 41. According to Mr. Trzupek of Huff & Huff, "power export is a very minor source of generation demand." Tr.1 at 357.

Dr. Overbye testified, however, that "it is very common to move power long distances." Tr.1 at 615. For example, "[o]n the West Coast, there's a lot of power from the Pacific Northwest that flows down to southern California." Tr.1 at 615.

Reliant stated that Illinois utilities must depend on imports from other states to meet its peak demand: "given similar economic growth throughout the Midwest, there has been less power available for import—leaving the state with a potential shortfall in generation capacity or supply." PC 1 at 2. Reliant stated that additional peaker plants in Illinois will restore balance between supply and demand. PC 1 at 2.

I. Illinois Lacks a Statewide Energy Plan

Many participants expressed concern that Illinois does not have a statewide energy plan. Mr. LaBelle of the Lake County Board suggested that:

> [T]he State of Illinois needs a plan and comprehensive licensing guidelines to assure that all regions of the state have reliable power. The plan should include identification of the power generation and transmission needed to support continued economic growth in Illinois. It should provide an analysis of the need

> for power in various regions of the state and an identification of the measures needed to assure adequate power is provided . . . . The plan should also include consideration of alternatives, such as improved transmission capacity that could reduce the need for additional generation capacity in certain areas. Tr.1 at 779-780; see also PC 190 at 4.

NRDC proposed a similar solution, calling for "a more comprehensive assessment of the actual need for the units being taken into account." Tr.2 at 62. NRDC suggested that Illinois develop a total energy strategy with stakeholder input to serve as guidance for State agencies to assist local communities in whether projects are a best fit for their areas. Tr.2 at 61.

The ICC presently does not have either a formal forecast of the projected magnitude of the peak demand for electric power, or an aggregate report on the amount of energy imported by and exported from Illinois utilities. Tr.1 at 37-38, 40. Citizens have expressed concern that ICC no longer keeps records as in the past. Tr.1 at 445.

Before the Illinois Electricity Choice Law, utilities had to file a least cost of planning report with the ICC, which gave a 20-year forecast of power demand. Tr.1 at 32. The reports allowed the ICC to generate forecasts of base-load demand, which were generally accurate from the early to mid-1990s. Tr.1 at 42. Executive Director Fisher of the ICC stated that "the last least cost energy plan filed by ComEd with the Commission was in 1996." Tr.1 at 24. The 1997 law eliminated the requirement to report to the ICC. As a result, the ICC currently does not have a formal role in reviewing overall electric generation in Illinois. Tr.1 at 32.

The ICC does receive some information by continuing to work with electric generators. Tr.1 at 37. The ICC held several hearings with utilities monitoring power generation when the summers of 1998 and 1999 placed extraordinary pressures on the system. Tr.1 at 32. The ICC also monitors the development of existing nuclear plants and reviews their existing lifespan. All Illinois nuclear power plants have a licensed life set by the Illinois Nuclear Regulatory Commission (NRC). The ICC is examining whether to lengthen the lives of existing nuclear facilities, because the Illinois plants are operating at an efficient rate. Tr.1 at 33.

Executive Director Fisher explained that organizations like MAIN are currently being phased out on the federal level in favor of new independent transmission organizations. Tr.1 at 38-39. According to Ms. Turnball, a consultant to various citizen groups, even if MAIN were to continue monitoring the region, it does not have access and keep records of forecasting specifically for Illinois. Tr.1 at 445. IPPs want their own access to the transmission network. Tr.1 at 39. Similarly, ComEd suggested that the State privatize the local generation portfolio in Northern Illinois. ComEd Exh. 1 at 9. ComEd believes that a number of different electric suppliers with market incentives to construct new generating capacity should create a portfolio, which "together with resources from other utilities, would meet the area's increasing needs over time." ComEd Exh. 1 at 9.

The ICC gave several reasons as to why companies are eager to site peaker plants: "Their relatively low capital cost permits them to provide high capacity to sell into the market for short periods of time when the market prices reflect peak demand." Tr.1 at 26. The ICC testified that combustion turbines are the least cost alternative for providing power on peak demand. Tr.1 at 24-25. "Modern gas-fired combustion turbines cost about $400 per [kW] of generating capacity whereas new coal-fired plants are estimated to cost about $1,600 per [kW] of generating capacity, and a nuclear generating plant costs between $2,000 and $5,000 per [kW] of generating capacity." Tr.1 at 25.

According to the ICC, a number of factors enhance the cost-effectiveness of modern gas-fired combustion turbines. Federal restrictions on building gas-fired generation have been removed, and gas prices predominately have been lower in the last ten years. Executive Director Fisher stated that, "[a]lthough the cost of natural gas has risen [recently], . . . the push for gas-fired generation does not appear to have dampened." Tr.1 at 25. Peaker plants have ready access to fuel sources in Illinois. Many major natural gas pipelines terminate in or are available to Illinois. Several of the lines go into the Chicago area. Tr.1 at 26. IEA noted that the available natural gas supply is coupled with a viable connection to the high voltage electricity transmission system. PC 167 at 5. According to IEA, the combination "is one reason that so many companies are interested in investing in our state." PC 167 at 5.

Executive Director Fisher noted that gas-fired plants are also more quickly and easily constructed and operated than other generators. Tr.1 at 25. Peaker plants offer flexible operating schedules, and can easily be turned on and off in response to peak demands. Some of the plants can even be operated by remote access. Tr.1 at 26.

According to the ICC, gas-fired generation units are also now more efficient. Executive Director Fisher stated that gas-fired generators further appear to have fewer environmental consequences than coal-fired plants. They also have less of a stigma and cost less than nuclear plants. Tr.1 at 26.

J. Effects of Peaker Plants on Electric Transmission and Distribution Systems

Constructing numerous peaker plants throughout the State raises issues about transmitting power from the new sources across the transmission grid. ComEd described the basic concepts behind transmitting electricity. Because a utility cannot readily store electricity, it must be instantaneously transmitted through a network of wires from generator to end-user. ComEd Exh. 1 at 3; see also PC 110 at 2. "When a customer turns on an electric light or appliance, sufficient power for that device must be generated somewhere on the grid at that moment." ComEd Exh. 1 at 3. The network of wires, or transmission lines, forms a national grid. ICC Exh. 1 at 2.

According to Dr. Overbye, a specialist in power systems, the national grid can be broken down into the transmission system and the distribution system. Tr.1 at 591. The transmission system, comprised of high voltage power lines, is connected in a grid. Tr.1 at 591. Numerous feeds that operate at the minimum of 100,000 volts connect to each point in the system. Tr.1 at 592.

Dr. Overbye explained that the distribution or lower voltage part of the grid is comprised of local or neighborhood wires, which are buried under ground in many places. Tr.1 at 592. "The distribution system is the source of practically all of the outages that we experience." Tr.1 at 592. Local wires are 95% of the problem. Tr.1 at 592. Dr. Overbye stated that, when an outage occurs, the national grid itself is still intact and "[t]here's still plenty of generation." Tr.1 at 593. "[P]eaker plants have no impact on the distribution system reliability." Tr.1 at 595. According to Dr. Overbye, the increase in peaker plants will not change the number of outages in Illinois. Tr.1 at 595.

However, peaker plants do have an impact on transmission system flows, according to Dr. Overbye. Tr.1 at 596. The national grid is designed so that power instantaneously redistributes on the system if a line is lost. Tr.1 at 594. Dr. Overbye stated that this kind of shift can transmit too much power through the line. Tr.1 at 595. For example, Mr. Steve Naumann of ComEd testified that, during the summer of 2000, there were multiple incidents of transmission loading relief on a daily basis, where sales from "one area to another were cut or curtailed because the transmission lines were being overloaded." Tr.1 at 295. This is similar to the circuit breaker shutting down when a homeowner tries to draw too much power. Tr.1 at 295. Dr. Overbye stated that we cannot "directly control the amount of power flowing on a line." Tr.1 at 594. As he explained, there is no valve. "Rather, we can only indirectly control it by changing the output of the generators." Tr.1 at 594-595.

Citizens have asked why generators want to locate peaker plants in more populated areas along the grid. Tr.1 at 759. According to ComEd, new local power plants reduce problems with transmission lines because "[l]ocal generation helps to support voltage on the system, especially near the generator." PC 164 at 3. Reliant commented that "locating plants near the demand 'strengthens the grid'. . . ." PC 1 at 11. Dr. Overbye stated that, "in power

systems, you're always trading off generation location versus transmission." Tr.1 at 595. He explained that "if you put up too much generation too far away from the loads without new . . . transmission, you can overload the grid." Tr.1 at 608. ComEd testified that "[y]ou can either build more transmission [lines] or locate generators at particular locations." Tr.1 at 595. ComEd elaborated:

> [T]he closer a generation source is to the load, the fewer potential problems there are with transmitting the power. If transmission lines become unavailable or overloaded, having local generation could allow nearby customers to remain energized.
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>
> As a matter of physics and prudent operation, only so much power can be transmitted through a given line; at some point, to keep the lines from overloading, a transmission owner must turn down request to transmit more power or curtail other transactions. * * * Because the lines connecting neighboring utilities and neighboring states in the Midwest, like all transmission lines, have finite capacity, there have already been numerous instances on which transmission requests were denied. * * * This is especially true during peak load conditions. It is therefore incorrect that either Illinois can depend heavily on generation in other states, or that Illinois-based generation will be used to supply huge amounts of load in other states. Unless or until massive new transmission line projects redefine the transmission grid, this condtion will remain for the foreseeable future. * * * And, regardless of interstate transmission availability, distant generation cannot support voltage on the local system to the same extent that local generation can. PC 164 at 3-4.

Each utility maintains its portion of the transmission grid. ComEd explained that when a non-utility generator requests access to the transmission lines that ComEd owns, it places the non-utility in a queue "primarily based on the date of the developer's initial interconnection request to ComEd." ComEd Exh. 1 at 6. ComEd maintains the queue because "one project may, if successfully brought on line, affect the plans of future projects." ComEd Exh. 1 at 6.

ComEd stated that it "works with each interested developer to design an efficient and reliable interconnection with ComEd's grid." ComEd Exh. 1 at 6. "Since the effective date of the [Illinois Electricity Choice Law], ComEd has worked with numerous developers to design interconnections with ComEd's grid." ComEd Exh. 1 at 8. "Once the generation plant is interconnected and operational, ComEd's OASIS electronic bulletin board allows market participants to request the delivery components of transmission service on ComEd's network, which, if available, enables the generator's electric power to move onto the regional grid." ComEd Exh. 1 at 6.

Mr. Elam asserted that "ComEd's shareholders, not necessarily consumers, stand to gain interconnection fees and wheeling charges if these peakers are built on the ComEd system." Lake County Exh. 4 at 14. Mr. Elam warned that "ComEd [and other companies] stand to make more money with less risk by selling its existing transmission system benefits to IPPs than constructing new transmission lines." Lake County Exh. 4 at 14. Mr. Elam added that "[g]eneration located at the northern end of the ComEd system benefits ComEd, the IPP, the natural gas company and the power marketer that owns the output of the generation, but does not provide any guarantee of benefit to the local community or state of Illinois." Lake County Exh. 4 at 15.

Dr. Overbye testified that the national electric grid is interconnected and very well designed. Tr.1 at 597. The purpose of the transmission system is to "take power from outlying areas and to bring it into the heavy load areas." Tr.1 at 600. Dr. Overbye stated that "[p]ower generated in Illinois can easily be sold to Wisconsin, Indiana, down to Tennessee, basically anywhere in the eastern part of the country." Tr.1 at 598. He claimed that it is not unusual to export or import power. Tr.1 at 598. "The transmission grid is used to supply power to the system from the generators that may be located quite distant from the load to the load." Tr.1 at 601.

ComEd stated that Illinois cannot rely on out-of-state peaker plants transmitting power because of the slow evolution of the interstate transmission grid. PC 164 at 4; see also PC 1 at 5. According to IMEA, "[t]oday's transmission grid is not the interstate highway to which some have compared it." PC 110 at 2. "Rather, it is a crosshatching of two lane roads with many areas of heavy traffic and troublesome congestion on the busiest days." PC 110 at 2. IEA also testified that "our system is really a Balkanized system that was built for the old electricity style of control area here, control area here, control area here . . . . It wasn't built for all the transfers that are taking place now between utilities in Pennsylvania and utilities in Wyoming." Tr.2 at 52-53. IMEA stated that the resulting transmission bottlenecks "have threatened parts of the State with mandatory curtailments as recently as this summer." PC 110 at 2.

ComEd explained that MAIN currently has regional rules and guidelines that prevent generators from overloading transmission lines. PC 164 at 4. According to ComEd, MAIN has denied numerous transmission requests because lines connecting neighboring states and utilities have reached their capacity. PC 164 at 4.

Dr. Overbye testified about the impact that an overload on a particular line could have on the power markets. Tr.1 at 601. "[P]ower markets are very large." Tr.1 at 602. The Midwest had a price spike in June of 1998. The spike occurred in part because of an overloaded transmission line in Northwest Wisconsin and an overloaded transformer in Southeast Ohio. Tr.1 at 602. When the Northwest Wisconsin line overloaded, several regions could no longer supply electricity to Illinois. Tr.1 at 602. "[O]ne little line wiped out the entire west for a market that we could get energy from. One transformer in Ohio wiped out

the entire east." Tr.1 at 602. "Locating generation in central Illinois . . . would definitely have helped the problems that you saw in northern Illinois or generation in Ohio would have helped as well." Tr.1 at 602.

Dr. Overbye also cautioned that this region's transmission system does have a major bottleneck in Northern Wisconsin, which is called the Eau Claire Arpin line. Tr.1 at 598. This line "limits a lot of the time how much power we, as Wisconsin and Illinois, can import from Minnesota and further north into Manitoba." Tr.1 at 598-99. IEA testified that Wisconsin has very serious transmission constraints caused by geographic barriers and a shortage of transmission capacity. Tr.2 at 50. Dr. Overbye warned that "when the line gets loaded to its maximum ability, we can't bring in any more generation from [the northern region of MAIN]." Tr.1 at 610. "Particularly, when we're having a hot summer down here and they've got cool weather up there, we can bring in a lot of power if we had a new line there or alternatively, we have to generate it more locally." Tr.1 at 599.

Mr. Elam similarly stated that "ComEd has had significant trouble moving power through its system from the south to the north into Wisconsin during peak periods." Lake County Exh. 4 at 8. Transmission of power across ComEd's system has been cut because it lacked the capacity to transport the electric power. Lake County Exh. 4 at 9. Peaker plants "installing generation on the north side of ComEd quickly enhances the lack of adequate transmission capability, but fails to address the issue of inadequate transmission." Lake County Exh. 4 at 8. Mr. Elam questioned why generation was not proposed, instead, in Wisconsin. Lake County Exh. 4 at 8.

ComEd controls a significant portion of the transmission grid in Illinois. "ComEd owns and operates a network of high voltage transmission lines and substations, which transfer power from generating stations or from other networks to local areas of load and to other networks." ComEd Exh. 1 at 4. "ComEd also owns and operates a system of local distribution lines and substations that carry power to ComEd's customers." ComEd Exh. 1 at 4.

ComEd recently became less involved as a generator and is concentrating on transmitting electric power. ComEd Exh. 1 at 9-10. ComEd is taking an active role in optimizing its transmission system. It has been studying its system to "determine the most convenient and, from an electrical standpoint, beneficial locations for new generation." ComEd Exh. at 10. "ComEd analyzed the intricate network of its [lines] . . . in a manner that maximized power delivery from the facility while minimizing modifications that would have to be made to the existing transmission network to accommodate that generation." ComEd Exh. 1 at 10. Mr. Shay, Senior Planner for Will County, stated that new generating facilities are trying to build in Chicago because many of the transmission lines and natural gas lines cross in the area and the plants would be close to a large power market. Tr.1 at 708.

Mr. Elam explained that FERC Order No. 2000 "is focused on making sure that our

nation's infrastructure is adequate and that our existing assets are used efficiently, without undue market influence." Lake County Exh. 4 at 16. The order "creates transmission only entities that will be run by independent operators, independent from market participants so that discriminatory practices are absent when improving and or expanding the grid." Lake County Exh. 4 at 13.

FERC "ordered all public utilities to join Regional Transmission Organizations (RTO) which will operate in essence as one large carrier." Lake County Exh. 4 at 13. The RTOs must facilitate the expansion of the national electric transmission infrastructure. Lake County Exh. 4 at 13. "Energy Secretary Bill Richardson recently commented 'we have the infrastructure of a third world country' when discussing the transmission system reliability." Lake County Exh. 4 at 13. Mr. Elam added that it should be noted that "the grid is looked at as a regional area versus trying to fix a market problem." Tr.1 at 830.

Mr. Elam cautioned that "the efforts of ComEd and other parties that will financially benefit have not been presented in these hearings to coincide with the efforts and planning of the RTO, which is not to have influence by a market participant." Lake County Exh. 4 at 14. Mr. Elam stated that, "[t]o arbitrarily build at the proposed sites without a coordinated effort . . . may be harmful and undermine the efforts of an independent organization such as the RTO, except those expected to profit." Lake County Exh. 4 at 14.

In June 1998, ComEd published a list of 14 preferred sites for new facilities. The list shows where generators can access the transmission network without major new upgrades or expansions to the transmission system. ComEd Exh. 1 at 11; Tr.1 at 296. The list, which does not examine land use issues, environmental impacts, or fuel availability, includes the following locations: (1) Zion; (2) Zion-Libertyville/Zion-Waukegan Right-of-way; (3) Lombard; (4) Silver Lake-Libertyville Right-of-way; (5) Silver Lake; (6) Libertyville; (7) Wayne-Silver Lake Right-of-way; (8) Wayne; (9) Prospect Heights; (10) Itasca; (11) Waukegan; (12) Electric Junction; (13) Lombard-Elmhurst Right-of-way; and (14) Pleasant Valley. ComEd Exh. 1, Att. D. ComEd stated that the last four sites require more significant upgrades, such as installing new transformers. ComEd Exh. 1, Att. D at 1.

Mr. LaBelle of the Lake County Board testified that ComEd should consider "alternatives to peakers, such as additional transmission lines." Tr.1 at 782. However, according to the ICC, building new transmission lines has proven to be difficult in the 1990s. Tr.1 at 26-27. The ICC stated that, "[i]n addition to ready access to fuel sources, electrical generating plants require access to significant transmission capacity to move its product through the market. The closer the combustion turbine peaker is to a natural gas supply and electric transmission lines, the less expensive it is to bring it on-line." Tr.1 at 26-27. However, public resistance to new transmission lines makes it less attractive to construct lines to increase power availability. Tr.1 at 27.

Mr. Dennis Wilson, a resident of the Island Lake area, testified about health problems

allegedly associated with transmission lines. According to Mr. Wilson, an English physicist from Bristol University is studying whether electromagnetic radiation can cause cancer. Mr. Wilson stated:

> [T]hey are coming up with some pretty good proof—is that in areas where you have high pollution, and as high pollution passes through the power lines, the particles become charged, and those particles remain charged for up to five miles away from those lines. That means if you have people living in that area they will be breathing that atmosphere of the charged particles. And what they are stating is that those particles will stick in your lungs at a rate of 100 times greater than it normally would if they were not charged. Tr.1 at 975.

Mr. Wilson testified that the existence of an energy field around lines can be simply shown by walking under a power line with a fluorescent bulb. Tr.1 at 975. He claimed the bulb will light up within 50 feet of the lines. Tr.1 at 975. Mr. Wilson further stated the National Institute of Environmental Health and Sciences conducted research that led it to believe the lines are carcinogenic. Tr.1 at 976.

Mr. Elliot "Bud" Nesvig, a professional elictrical engineer who has been involved with the Evanston energy commission, alleged that the distribution system that ComEd owns is antiquated. Tr.1 at 697-698, 704-705. According to Mr. Nesvig, ComEd stated in a May 2000 meeting in Itasca that the utility "had not maintained the distribution system for 20 years." Tr.1 at 706. Mr. Nesvig claimed that ComEd estimated "it would take more than two years to bring it up-to-date." Tr.1 at 706. He also testified that the continual overloading of distribution lines deteriorates their effectiveness and causes more frequent outages. Tr.1 at 706-707.

Mr. Elam stated that transmission lines "do not emit SO_2, NO_x, or any other hazardous pollutants." Lake County Exh. 4 at 13-14. Mr. Elam added that although they can be unsightly and take up space, the lines can be engineered to be more aesthetic and are needed to enhance the electric power system. Lake County Exh. 4 at 14.[18]

[18] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

IX. SITING

In this portion of the Report, the Board summarizes record information on the siting of peaker plants. Specifically, the Board first summarizes citizen concerns, then suggestions from citizens on siting peaker plants. Next, the Board summarizes, in turn, information on siting from State government, industry, and local government.

A. Concerns of Citizens

1. Clustering/Cumulative Effect

Many citizens expressed concern about clustering of multiple peaker plants in residential areas. Ms. Dorge of LCCA stated that "[w]e can have two across the street—we have two across the street from each other in Zion, the outskirts of Zion with 18 stacks. What is to prevent us from having 10 or more in close proximity. " Tr.1 at 460. Ms. Cathy Capezio, a resident of Aurora elaborated: "There should not be two peaker power plants within a two-mile radius when you have four communities that probably total over 300,000 people in a close proximity of these plants . . . ." Tr.1 at 479; see also CAPPRA Exh.1 at 2.

Ms. Zingle, Executive Director of LCCA, testified about potential air pollution from the clustering of plants:

> They're very much concentrated in the six county area and they centrally ring Lake County, and we're downwind of it, so are we concerned about the overall cumulative effect of these and what are we doing to our situation with NO_x emissions and nonattainment? Tr.1 at 534-535; see also Tr.1 at 912 (Geiselhart).

Mr. Kucera, an attorney with Chapman & Cutler appearing on behalf of the Lake County Public Water District, questioned what the impact would be of multiple draw-downs on an aquifer at a particular location. Tr.1 at 768-769. Mr. Chris Goebel, a member of CAPPRA, stated "we're going to see problems with this, problems that we don't know the true outcome of what's going to happen." Tr.1 at 559.

Ms. Terry Voitik, founder of CAPPRA, asserted that current regulations are inadequate, stating that it is "absurd that the IEPA with the USEPA's endorsement continues to issue permits and give the green light without regard to the cumulative effects of multiple plants in our nonattainment zones." Tr.1 at 485. Ms. Zingle testified that legislation is needed to address the clustering of facilities:

> It is the aggregate effect of millions of cars in the United States that has prompted comprehensive regulations of automobile emissions, not the discharge from a single car. It is totally illogical to disregard the cumulative effects of the peaker plants. Tr.2 at 183; see also Tr.1 at 1,010-1,011 (McCarthy).

NRDC stated that "[n]atural gas-fired combustion turbines represent the best available large-scale fossil fuel generation in terms of minimal adverse air quality impacts . . . ." However, "the aggregate impact of the proposed combustion turbine projects in Illinois would amount to several hundred tons, likely to be emitted during the worst ozone episodes." PC 109 at 5-6.

2. Decrease in Quality of Life

Mr. Maurice Gravenhorst, a member of CAPPRA, testified about his concerns over siting peaker plants near residential areas:

> I am very concerned about the power plant in my community at the corner of Eola and Butterfield Road. It is two miles east of my property. I moved to Aurora because I liked the area and I was real happy with the environment and forest preserves and everything around me was so natural. I lived on a 23 acre wetland that was donated by a developer. Had I known about Reliant and peaker power plants and all these things, this would not have been my choice to move out here because the last clear breath I will take will end in spring of 2001 when the plant at Eola and Butterfield will go into service or so they say, and it really is a tragedy. Tr.1 at 491; see also Tr.1 at 449 (Dorge).

3. Proximity to Residential Areas

According to Ms. Zingle, "the power companies are interested in locating naturally where the power lines and the gas mains intercept. If that happens to be adjacent to a subdivision or in the middle of green fields or in an airport flight path, there doesn't seem to be much concern from the power companies." Tr.1 at 518. Ms. Stark, Director of CARE, stated: "There's residences around there. There's a school within 1,000 feet. I mean, none of that is taken into consideration." Tr.1 at 652-653; see also Tr.1 at 482 (Capezio).

Ms. Carolyn Muse, a resident of Zion, testified: "My husband and I are very concerned [about] the groundwater. Everyone in the area has wells. We have septics. The siting of that plant I don't know how it happened, but it should not be next to residential areas." Tr.1 at 956.

4. Property Values

Ms. Johnson of the Rural and City Preservation Association stated: "We know this will affect property values and future development in the area." Tr.1 at 549; see also CAPPRA Exh.1 at 2; Zingle Exh. 8 at 2.

5. Environmental Justice

NRDC stated that peaker plants:

> [S]hould avoid disproportionately burdening any community, but particularly low income communities and communities of color . . . . [M]any potential host communities are convinced from their experiences that existing local zoning

> requirements are not adequate to address all the public interest concerns . . . . That may be in part attributable to the lack of coordination between municipalities and Illinois regulatory agencies involved in permitting new electric generating facilities, particularly [IEPA] . . . . PC 109 at 7.

Ms. Zingle testified that "[t]he villages that spend the money get the results. Villages like Lockport who simply try to rely on the system do not. It creates a terrible disadvantage for the [less] affluent cities and for the less aggressive." Tr.1 at 518-521; see also Tr.1 at 676 (Zingle); Tr.1 at 916-917 (Geiselhart); Tr.1 at 939 (Owen). Ms. Beverly DeJovine, a member of Bartlett Citizens Advocating Responsible Environments (Bartlett CARE), an environmental group opposed to peaker plants, testified:

> [W]e're very concerned about the siting of this plant and the zoning for this particular plant. We're very concerned that—who is to stop anybody else from—any other power generation company from coming into Bartlett and putting one right next door to this. If we say yes to one, we will not have any legal basis to say no to any others. Tr.1 at 543-544.

5. Home Rule

Ms. Zingle noted:

> We do have a difficulty though and he touched on there, areas that are not home ruled can only regulate those things specifically allowed to by the state. So we were told by the state's attorney that he can't do that particular ordinance, but we did it anyway and we'll see what happens. We were told we can't do noise more stringently than the state even though we'd like to. We can't introduce enforcement things where the state decides. We can't even enforce the noise ordinance. * * * [O]ur hands are tied." Tr.1 at 526.

6. Local Zoning

Ms. Turnball, a consultant to a variety of citizen groups, a private foundation, and businesses opposed to peaker plants, testified:

> [S]iting is now local and siting is impacting most municipalities who have zoning ordinances that wouldn't have included a category for that particular business because even though there might be a statement in the zoning ordinance that says public utility station, they aren't a public utility. So we have local governments which in most cases that I have seen a zoning ordinance where this new business, and I think we need to talk about it as a new business, didn't exist in the zoning ordinances and that is of a concern. Tr.1 at 436-437; see also Tr.1 at 1,121-1,023 (Sargis).

Ms. Owen of Zion Against Peaker Plants stated that "peakers were not anticipated by existing zoning courts. They don't even need a special use permit from the Zion zoning board. An art gallery does, but a peaker plant does not." Tr.1 at 940.

7. Lack of Input from Neighboring Communities

Citizens expressed concern over the lack of input a neighboring community has on the siting of peaker plants. Ms. Zingle offered an example:

> One of the difficulties we had with Zion is that they will not permit the neighbors to speak in public hearings at the village board meetings. They claim this is all being agitated by outsiders, yeah, it's because the outsiders are the ones that live 500 feet from the plant. It's the outsiders what are going to feel the effects. Tr. 1 at 531.

8. Complexity of Issues for Local Boards

Mr. Sargis, an attorney who works with various environmental groups, stated that "many communities, both government and the public, are ill-equipped to evaluate the potential impact of facilities that are not yet familiar in Illinois." Tr.1 at 1,121-1,023; see also Tr.1 at 476 (Goff), 502 (Arrigo), 511, 524 (Zingle), 553 (Johnson), 646 (Stark), 868-869 (Eaton). Ms. Zingle testified that "[i]n Zion, we have a used car salesman, a high school superintendent, a teacher, a retired accountant. How do they know how to judge emissions or ask about point maximum impact. They don't. They're not stupid. They just don't know." Tr.1 at 529.

Mr. Eaton, an attorney for several organizations, including a homeowners association, testified:

> [T]oo often local regulatory agencies believe that the IEPA, in issuing a permit, has exhaustively studied the situation and resolved all the issues. Even worse, they may believe that the IEPA has preempted the field. It should be made clear that local governments are entitled to impose more stringent pollution control measures than does the IEPA, should they choose to do so as far as their siting process. Tr.1 at 892.

Ms. Zingle asserted that the "village board is completely dependent on the representations of the power companies for their information . . . ." Tr.1 at 518; see also Tr.1 at 537-540 (DeJovine), 646 (Stark). Ms. Zingle explained:

> [The power companies] use the reputation of natural gas as a clean fuel and trade on fears of brown-outs to sell their products. They sometimes maybe

> stretch the truth. These are things I've heard at village plan commissions. This one was under oath. Our plant doesn't emit ozone. Technically, it's true. No, their plants don't emit ozone. We have our EPA permit. The IEPA says we're clean. No, the IEPA says you could pollute up to 250 tons a year. The artist's rendering of this plant isn't quite to scale. No, it's not. It [omits] 12, 105 foot tall 20 foot diameter smoke stacks. The nearest resident in the city is over a half mile from the site. That's true, but the nearest residents overall in the unincorporated area is less than 500 feet from the site. Emissions are small compared to other plants. This is my favorite. They'll take the Waukegan plant and the Pleasant Prairie plant and say, see, we don't pollute as much as they do. No, of course you don't. The villages have a responsibility to research and ascertain the claims of the company and each is laboriously going through the same learning curve without guidance or help. Most of the villages are unaware of the need for an air construction permit and that data on emissions or stack height or operating hours or fuel types is available and documented. Even those that find the existence of the permit, really aren't really good at running around and showing it. We need help interpreting its contents. The village's reactions to the new plants vary from the sublime to the ridiculous. From Libertyville who went through 20 highly structured plant commission hearings addressing air, need, noise, water, zoning, property values and so forth, to Zion who has two plants coming in across the street from each other who has had no public hearings in over nine months of controversy. Tr.1 at 518.

B. Suggestions of Citizens

NRDC advised that "[w]hen applications are pending for multiple facilities, siting boards should select those that best meet these criteria rather than approve applications on a first-come, first-served basis." PC 109 at 7. NRDC believes that the Board should integrate:

> [T]he currently disjointed local zoning review process with consideration of draft state administered air and water permits. * * * NRDC supports siting laws that encourage new power plants to: (1) use renewable fuels; (2) implement state-of-the-art air and water pollution systems; (3) locate on or near existing power plant sites that do not require new fuel supply or transmission infrastructure; and (4) avoid disproportionately burdening low-income communities and communities of color . . . . [S]iting laws should ensure that cumulative environmental and public health impacts decline over time as capacity increases. PC 109 at 9-10.

NRDC also stated that some entity should take over the ICC's old role and develop "a comprehensive energy strategy for Illinois": "The issues associated with permitting and siting a large influx of single cycle natural gas-fired generating capacity do not necessarily

require . . . comprehensive power plant siting regulations or legislation, but rather a comprehensive energy planning process, ecompassing functions once carried out by the [ICC]." PC 109 at 10. Other suggestions are described below.

1. Siting Template

Given the concern with the ability of local boards to site peaker plants, some citizens suggested the need for a siting template. Tr.1 at 529, 544 (Zingle), 868-899 (Eaton). Mr. Eaton testified:

> We wish to be clear that we are not recommending a reinstitution of a statewide regulation. However, what we are suggesting is that there ought to be an effort made on a statewide comprehensive basis to assist local governmental agencies to fill this gap. What we believe is sorely needed is a sound set of principals, guidelines and criteria to assist local governmental agencies to properly evaluate power plant siting requests and to evaluate whether a proposed site is a good site. Tr.1 at 890; see also Tr.1 at 900 (Eaton).

2. Preferred Locations

Mr. Eaton and other citizens suggested that peaker plants should be sited at existing industrial locations or brownfield areas. Eaton Exh. 1 at 17; see also PC 14 at 2. Mr. Dennis Wilson is from the Island Lake area. He stated:

> Now, in talking about these plants, what we are really talking about here is siting issues. When they can take and bring in a $250 million operation on top of residences 1,200 feet away, there is something wrong with the regulation. * * * I have heard in testimony earlier this evening that maybe brown areas were better for this. Industrial property might be better than this. But having researched this for quite a period of time now, it has been two years, I have a completely different opinion. I think that these plants should be located—because they [can] wheel the power great distances as we have heard—way out in the country away from everybody. Tr.1 at 974.

3. Multi-Jurisdictional Oversight

Ms. Schmidt, a member of the River Prairie Group of the Illinois Sierra Club, testified: "We are advocating for regional use of land and that regional planning be done in this process. If regional use is considered, then one municipality cannot be allow a proposed plant to be built on its perimeter thus protecting its own residents, but without regard to the neighboring communities." Tr.1 465-466; see also Tr.1 at 980-981 (Jacobs), 449 (Dorge), 858-859 (LaBelle).

4. Bonding

Mr. Eaton emphasized the importance of bonding:

One guideline or recommendation that we feel is vital in power plant sitings is for communities to require reliable, suitable and adequate bonding to cover disassembly, site remediation, and any other possible consequences of a decision of an [IPP] to discontinue use of a power plant after it has been built. Tr.1 at 876.

5. Notice

Ms. Turnball advocated that IEPA provide certain notices:

I would like to suggest that [IEPA] require the applicant to provide a list of the adjacent property owners within 500 feet of their proposed facility and a list of all the municipalities within a mile and a half unless they're in a municipality and that the IEPA would then send public notices to that list so that the people who are going to be affected by it would have a knowledge of this. If they're having to do any kind of zoning—local zoning, that's a list that they could have developed for that anyway and then the public can, at least, have some knowledge and attend the meetings in case they don't happen to hear about a public notice. Tr.1 at 442.

6. Siting Approaches in Other States

Mr. Silva of NRDC testified at length about siting approaches in other states:

Essentially, we would suggest that Illinois consider a process whereby a more comprehensive total energy strategy is developed with stakeholder input that would essentially serve as a blueprint to help guide decisions of various state agencies, whereby the communities right now, many municipalities in the state have complained, rightfully so, that they feel somewhat bereft of state assistance in assessing whether or not some of these projects are a best fit for their particular communities. * * * [S]ome of these kind of centralized processes that are available in states such as California and New York[19] allow for participation of the public and fund that participation as part of the permit applications for the plants. They essentially provide for intervenor funds based on a prorated share of the proposed generation capacity of the unit which is allocated for expert witnesses and technical assistance to the communities and the stakeholders. * * * For example, under Article X of the New York Public Service Law, it's a 50-50 split on projects where projects are assessed at $1,000 per [MW] up to $300,000 maximum for a project, and that—those funds can actually be split between the municipality involved and interested stakeholders.

[19] For descriptions of the New York and California processes for siting electric generating plants, please refer to Appendix H.

Any balance of funds that are not exhausted are then returned to the applicant. That would be—That's one part. We're not saying that that's the only solution or the best solution for Illinois. That's an option that we thought it was important to mention and provide some solution and a greater sense of control.

* * *

The siting process for the State of New York is based on Article X of the New York Public Service Law. It creates a New York state board on electric generation siting and the environment. Most of the board members are appointees of the governor or are actually the heads of various state agencies or their appropriate representatives. It actually requires a multistep review process. There's a preliminary scoping statement that's first required to be submitted. The applicant then has to publicize the project and actually establish a presence in the potential host community to ensure that there's adequate opportunity for the public to gain information. I mentioned in passing that there was a requirement that when the full application is filed that a fee equal to the prorated amount of its maximum generating capacity up to $300,000 be made available to provide for expert witnesses and public assistance to the host community and any interested parties or organizations, and that it go through an open hearing process and—but ultimately—and we're not taking a position one way or the other—the—under Article X, the siting board does have the authority to supersede local municipal zoning ordinance, so that's something that I wanted to point out.

* * *

I think that for Illinois, it would be quite worthwhile to look at most of these processes that offer integrated evaluation. I don't think that it's necessarily the best approach. Another example that's immediately adjacent to you is Wisconsin, which has a long and a fairly well—highly regarded among energy officials and energy analysts as having a very good process of evaluation. Now, that doesn't mean that the—it's going to be a great fit for Illinois' circumstances. I think when it comes down to it, frankly, you're going to have to pick and choose among what the existing programs are defined, what works best. I'm also saying that, frankly, recognizing political realities, that a lot of the stakeholders in this process have interests that they're seeking to protect, and they will probably lobby quite forcefully to protect those interests. So I am not suggesting that a comprehensive perfect siting law is the only thing you should be looking at, but I think the whole process of looking at good siting laws that offer an inclusive process for municipalities in particular that currently are feeling like they're getting battered by the current existing process . . . . Tr.2 at 62-63, 77-78, 103-104; see also McCarthy Exh. 2.

Ms. Zingle stated: "No state that we found yet leaves the siting of power plants exclusively to local control with no guidance or supervision from state environmental regulatory bodies." Tr.2 at 173.

7. Pollution Control Facility Siting in Illinois (SB 172)

In Illinois, the Act sets forth a process for siting pollution control facilities, including landfills. The process, commonly known as "Senate Bill 172" or "SB 172," was discussed many times in this record as a potential model for siting peaker plants. Ms. Zingle suggested that an appropriate approach to siting peaker plants would be one similar to SB 172:

> The landfill siting procedure commonly described as SB 172 has great potential for easing some of the distress over determining the proper locations for peaker electrical generating plants. Among other things, it calls for the issuance of an overall permit to operate the facility; it provides structure for the decision-making process and highlights areas of concern; it provides for expert technical advice and guidance; it provides for input and some control from neighboring communities. Most importantly, it allows, I think, for local control of the process and upholds local zoning ordinances. Now, I read that from Director Skinner's comments on SB 172. I've had some conversations with folks here in the audience today that think that SB 172 trumps local zoning ordinances. I don't—I want to keep an element of local control in all of this. Villages have a right to be stupid or not as they choose with some—within some parameters, so I'm supporting SB 172, assuming that it does in fact provide for local control input. The first seven criteria[20] used in the landfill siting decision process are fairly easy to adapt to the peakers. Points 8 and 9 pertaining to counties with solid waste management plants obviously don't apply to peaker plants. There is need, however, for more specificity in point 2, which is the facility is so designed, located and proposed to be operated that the public health, safety and welfare will be protected. There is no way for the local community or the siting board to adequately ascertain those facts without, one, the draft air permit, including analysis of the effect of PSD increments and future economic development in the area, the point of maximum impact, the effect on local and regional air quality in conjunction with other pollution sources in the area, effect on soils, livestock, habitat and so forth. Tr.2 173-176; see also Tr.1 at 462-463 (Dorge), 554 (Johnson).

Ms. Zingle advocated a siting process for peaker plants that "requires that neighboring

[20] Under the Act, the local siting authority must determine whether the proposed pollution control facility meets each of nine statutory criteria. See 415 ILCS 5/39.2 (1998). Those criteria are set forth in Appendix I.

villages be allowed to testify and cross examine witnesses" and that "delineates some of the standards under which the decision has to be made and then allows the neighboring villages to sue if the host village does something completely out of line." Tr.1 at 531. Elaborating, Ms. Zingle considered SB 172 "[t]he best model I think that I can find so far" for a number of reasons:

> [I]t requires—the host community still makes the decision, but it requires them to have a hearing or a series, if necessary, that would involve the community, neighboring communities within a mile and a half, the company that's looking to site the plant and it allows cross-examination. It starts to spell out the standards under which the decision will be made so you can't have a sham hearing, we'll just have the hearing and vote to do it anyway regardless of the effects, which would give the neighboring communities the right to sue if, in fact, a decision is not made appropriately. It still needs local control, but, in fact, if I understand it right, but that starts the participation of other groups. I would like to see that hearing take place at about the same time as the IEPA air hearing because there's information in those permits that is invaluable to the city. Tr.1 at 669.

Ms. Zingle does not want State siting standards to be voluntary:

> I don't completely want to leave it up to just do a model and then if there is a greedy or stupid or whatever village board out there that the citizens left hanging again. I want them to have to meet some standards in how they make the decisions. Tr.1 at 531.

Mr. Eaton had reservations about using SB 172:

> I think it is a little bit of a square peg in a round hole problem. I really think that [a procedure for siting peaker plants] needs to be its own creature. Landfills, for example, strike me as being more uniquely local in impact than these power plants. I guess I say that primarily because of the air pollution and noise aspects, especially the NO_x emission and noise aspects and VOCs and so forth that you don't—those are problems that are more regional, statewide, interstate, in effect, not so much the noise but particularly the NO_x and also that I think there are some problems with SB-172 that have been alluded to earlier that the problem that Wadsworth has with Zion, for example, is not fully addressed I guess under SB-172. I guess all I am saying is that some aspects, something similar to that might well be suitable. I would just not like—I don't think we want to force our plant siting into a strictly SB-172 mold, to the extent I understand the SB-172 mold. Tr.1 at 901-902.

C. Information from State Government

1. Citizen Concerns as Perceived by IEPA

Director Skinner of IEPA provided extensive testimony about siting and local land use considerations, though noting that "[l]ocal units of government are in a far better position to evaluate the effectiveness of their existing zoning requirements." IEPA Grp. Exh. 1, Skinner at 8. He emphasized that a facility other than a new pollution control facility is subject to local zoning requirements, regardless of whether IEPA issues a permit to the facility. Tr.1 at 63.

Director Skinner testified that citizens have two basic objections to using only local zoning laws to site peaker plants. The first is that "most local government[s] are not sophisticated enough to undertake the necessary analysis with regard to these peaker facilities." Tr.1 at 68. The second objection is that if a peaker plant is "located on the edge of town, residents of the adjacent community do not have a meaningful opportunity to impact its neighboring community's land use decision." Tr.1 at 68. Mr. Romaine of IEPA testified that "members of the public also routinely express concerns about the impacts of proposed plants on property values, local water wells and the character of the area in which the plant is proposed to be located." Tr.1 at 105; see also Tr.1 at 135 (Zak).

Regarding the alleged lack of sophistication of local governments to address peaker plant siting, Director Skinner stated that "[l]ocal governments address the aesthetic issues, traffic issues, property value issues every day. To a large extent, that is what local governments are there for . . . ." Tr.1 at 68. He testified that IEPA addresses the technical issue of air analyses: "while local communities can undertake air analysis separate from the air analysis that we undertake if they so desire and can impose, in fact, through their local process, stricter requirements, if they so desire, it is not necessary that they do that." Tr.1 at 68.

However, Director Skinner acknowledged that concerns over the inability of neighboring communities to impact a host government's siting decision are "a legitimate issue and is something that the Board and perhaps the [G]eneral [A]ssembly ought to consider." Tr.1 at 69. While stating the "the siting aspects of this deserves some scrutiny," Director Skinner testified that he does not know if the "full blown SB172 requirements ought to be applied in the peaker context." Tr.1 at 202. He "can see an argument" as to why:

> [S]ome subset of those ought to be applied, if only the subset that prescribes certain procedures with regard to consideration of these applications because those procedures provide resources to the local hearing panel that allow them to deal with some of these issues, to hire the lawyers and the consultants that they might find necessary to address the concerns that are being raised by the constituents. Tr.1 at 202-203.

In evaluating whether IEPA sufficiently regulates peaker plants, Director Skinner noted that "if gaps exist[] right now, they largely exist on the sitings or local control side of this issue. Property values, noise, esthetics, those are to a large extent the complaints that . . . we're hearing that ring truer, if you will, than some of the complaints about emissions." Tr.1 at 201.

2. IEPA Authority Over Peaker Plants

Director Skinner addressed the scope of IEPA's ability to regulate peaker plants:

> [W]e frequently receive comments regarding the potential effect of peakers on things like aesthetics, appearance, traffic, property values, things that the folks in the local community would be expected to be concerned about. I will state first that [IEPA] is not authorized by state law to consider these types of issues in its review of permit applications. These types of land use issues are left to local units of government. And while we attach conditions occasionally to these air permits, we don't have the latitude to impose conditions that are unrelated to air quality. Tr.1 at 61-62; see also IEPA Grp. Exh. 2 , No. 20 at 2.

Mr Romaine stated that IEPA's "authority under state law is narrowly limited to consideration of environmental issues and in the case of construction permits for emission sources, matters related to emissions and air quality." Tr.1 at 105. Director Skinner emphasized that IEPA's air permit to construct a peaker plant does not supercede local zoning." Tr.1 at 63; see also IEPA Grp. Exh. 2, No. 20 at 2.

3. Cross-Jurisdictional Authority

State Representative Cowlishaw offered these thoughts:

> [W]hile respecting the zoning jurisdictions of municipalities, which I believe it is our obligation, still county governments perhaps should also be involved in final approvals for proposed sites of peaker power plants at least in the northeastern Illinois area, but even beyond that, this is a regional matter and I think that it would be very helpful to involve the Northeastern Illinois Planning Commission or what's commonly called NIPC. Tr.1 at 387.

State Senator Link testified:

> Since the effect of peaker power plants, air quality, water supply, natural gas supply, noise, taxes, are felt regionally, not just locally. I believe we must take a regional approach in regulating the peakers. We cannot have patchwork local decisions. The state needs to step up in a responsibility to guide this process. Tr.1 at 752-753.

4. SB 172

Director Skinner stated that, before SB 172, "the comments of local authorities in Illinois were not binding on the state and specifically were not binding [on IEPA] in the siting and permitting of sanitary landfills and other pollution control facilities such as transfer stations and incinerators." Tr.1 at 65.

Director Skinner testified that "SB 172 dramatically changed that scenario, or dramatically changed the permit process by requiring the county or municipalities in which the facility was located to conduct hearings, specifically on the proposed project in order to determine whether the facility met certain enumerated statutory criteria." Tr.1 at 65. He continued: "The end result of placing 172 siting, local siting's approval in their permitting issuing process was to place local government in the role of making all relevant decisions regarding location, suitability for a proposed facility either to the local siting approval process or through [traditional] zoning ordinances." Tr.1 66-67. IEPA cannot issue a permit to develop or construct until the criteria are met and local siting is obtained. Tr.1 at 65. He added that IEPA has "no direct involvement in the actual SB 172 hearing process," and that IEPA's role is "essentially limited to making sure that the permit applicant submits [proof that] . . . local siting [approval] was obtained pursuant to SB 172." Tr.1 at 63-64.

Director Skinner explained that Section 39.2 of the Act provides that local authorities are to consider "nine criteria in reviewing applications for siting approval." Tr.1 at 66. He noted that Section 39.2(g) "provides siting approval procedures, criteria and appeal procedures to be followed." Tr.1 at 66. Director Skinner stated that "peakers are currently not subject to SB172." Tr.1 at 67. He explained that a natural gas-fired peaker plant does not meet the definition of a "pollution control facility" and that natural gas used in "the peaker fashion" does not meet the definition of "waste." Tr.1 at 67.

Director Skinner also testified that the inapplicability of SB172 does not "relieve the peaker applicant from going to the local community in order to assure that it is compliant with all necessary zoning approvals as were necessary in obtaining either a special use permit or some other sort of zoning changes from the local government." Tr.1 at 67.

5. Noise

Mr. Zak of IEPA stated that siting issues are relevant to potential problems with peaker plant noise. Mr. Zak testified that "setbacks are an important concept in addressing peaker noise." Tr.1 at 134. Mr. Zak suggested that one method of addressing peaker noise is employing "setbacks, land buffers, consisting of land owned or controlled by the peaker plant." Tr.1 at 134. The amount of land necessary to remedy problems with peaker plant noise would "depend upon what level of noise abatement was included in the initial design of the peaker plant." Tr.1 at 135. As with any other type of industrial noise source, "if peakers

exceed the noise regulations, they could significantly affect negatively on property values." Tr.1 at 135. This is because noise at these levels would likely "be noticeable by prospective purchasers of property and any potential commercial investors." Tr.1 at 135.

6. Water Quantity

Dr. Winstanley of DNR noted that use of groundwater is not a local issue because "groundwater typically is found in discrete aquifers that transcends political jurisdictions. They cut across municipalities, counties and even states." Tr.1 at 157. Therefore, "plumbing management by individual communities will not solve problems in the long term," rather Dr. Winstanley suggests we need to take an "aquifer-wide perspective." Tr.1 at 157. Dr. Winstanley noted that comprehensive planning and management is necessary. Tr.1 at 159.

7. Role of the ICC

Executive Director Fisher of the ICC explained the ICC's role in siting power plants:

> For decades, electric utilities would come to the Commission requesting the authority to construct new generating plants in specific sites. Utilities seeking a certificate of public convenience and necessity for a new plant were required to demonstrate an economic need for the additional generating capacity. If they did, the ICC granted such authority, including, if required, eminent domain authority. Non-utility generators did not have to request such authority, either before or after the 1997 Illinois deregulation law: provisions of Illinois law addressing siting of electric generating facilities have not changed. What changed is that electric utilities could no longer be ordered to construct new generating plants if they did not request such an order. Also, as noted earlier, and probably more significantly, the FERC's 1995 order [FERC's Order 888 requiring electric utilities to provide open access to their transmission system to any entity interested in moving or "wheeling" electricity from one part of the grid to another for wholesale purposes] opened the interstate transmission system to wider access and made non-utility generation economically attractive, especially over short distances. Thus, the builders of new generating plants to meet demand in Illinois are not primarily utilities. ICC Exh. 1 at 5.

8. Siting Approaches in Other States

Executive Director Fisher of the ICC explained that some states have taken approaches to siting similar to that of Illinois. However, others have established state siting committees either as part of or separate from state public utility commissions. Unlike Illinois, California, New York, and Ohio, for example, use state siting committees to determine where peaker plants should be sited. Texas, on the other hand, has a system similar to the current system in Illinois: local zoning boards control siting, and the state environmental agency controls

permitting. PC 8 at 3. Wisconsin requires traditional certificates of convenience and necessity for peaker plants. Kentucky does not require any approvals, other than state environmental permitting and local zoning, as long as the peaker plant sells the electricity it generates wholesale on the market. PC 8 at 3.

D. Information from Industry

Mr. Erjavec of Indeck argued that there would not be a significant impact on residential areas regarding water use, noise, or air pollution. With respect to air pollution, Mr. Erjavec stated:

> [T]hat's the air concentrations that are generated in your home when you're cooking. Again, compare that to the ambient concentration that would be experienced or would, on the worst case level, be generated by the power plants; again, far below anything that we experienced from that. Another comparison that we've tried to make is to the impact that you would receive from a home or a school. Now, let me be very clear about this, we're not trying to imply that a home or a school emits on a pounds-per-year basis anywhere near what a peaking plant does. That's just not true. However, what we need to be concerned about is what people experience. If you were in your backyard, what would you breathe? If you were walking down the street, what would you breathe? These are typical numbers. Again, the power plant number we've seen, 0.028 micrograms per cubic meter, in the wintertime, the ambient concentration around the house outside in your yard is about .01. Tr.1 at 237-238.

With respect to noise, Mr. Erjavec testified:

> Board members from McHenry County were taken to a tour of a peaker plant operated by the local utility in Springfield, and, you know, there's a quote, they didn't hear anything. We've also talked to homeowners living near peaker plants that just do not hear them. Mrs. Carver here that I discussed—I had a few conversations with the lady. She operates a wildlife preserve between the plant that's down there and her home, and the deer come all the time and there's not been any impact, you know, from a noise issue in terms of deterring them from coming either. Tr.1 at 241-242.

Mr. Erjavek also stated that "there are other industries out there that have significantly larger impacts than a peaker plant would have in its own backyard, and this is from 45 miles away." Tr.1 at 250-251.

Mr. Erjavec discussed the issue of siting and noted:

> [W]hen people look out and they say, well, gee, a gas line has come very close to an electric line. That's where a lot of peaking plants are being sited. There's been suggestions that these plants be sited miles away from the gas and electric and that we run lines to them. Yes, it's technically feasible. I think the amount of disruption to be created by that is a lot more than by siting them nearby. We've just discussed the impacts, and they're minimal. It doesn't always make sense. Yes, it can be done. Tr.1 at 242-243.

Mr. Erjavec compared siting peaker plants to siting rail stations:

> [A] rail station was being built. It was built adjacent to a parking lot and a rail line. Now, are there impacts from that rail station? Probably. There's traffic. There's noise. There's cars. But at the same time, you've got the infrastructure there, and we would agree with the developer that that makes sense. Now, if I was to turn around and suggest that he put the rail station three miles away and run a rail spurt, he'd probably think I was nuts, and I think that the same thing can be said in terms of siting peaker plants. Tr.1 at 243-244.

In discussing whether there should be additional siting regulations, Mr. Erjavec noted that "well, we've already taken a look through peaking plant impacts. For many measure, the impacts are minimal. If you review a lot of local zoning codes, most zoning codes already allow for somewhere in the code for uses that have greater impacts, whether it be noise, air pollution, water use, what have you. Really, right now, they are handling that end of the things." Tr.1 at 252-253.

Mr. Erjavec testified about how peaker plants are sited in other states:

> [O]ther states have a coordinated approach. All issues are directed through a single siting agency. It should be noted that in most of those states the siting Board then will overrule any local zoning too. It tends to make it a one-handed process instead of a process that plays off between two different entities, and it works more efficiently for them. Tr.1 at 254-255.

Ms. Greenberg of MWIPS stated:

> The developer typically works with the community to address the concerns that are raised with respect to noise, and I think the statement we heard yesterday that there have been no noise complaints to the EPA about peakers is really very telling because what it says to me is that, in fact, these developers have succeeded in addressing the concerns or we certainly would have complaints because people tend to be vocal about their concerns with respect to these plants. I wanted to just share with you one anecdote that I did hear from a member when a group of local officials was visiting one of the peaker plants.

> The officials came to the plant and started their tour, and at one point, somebody asked when is this plant going to start up so we can hear it, and the answer was, it's been operating since you arrived here. Tr.1 at 329-330.

Ms. Greenberg attributed electric industry problems in California to siting and stated:

> Illinois should be very cautious about imposing stricter than necessary siting requirements in order to avoid the very situation that we're seeing in California. We don't want to create a situation that would risk a power shortage and the accompanying increase in the cost of wholesale power as well as possible reliability problems. California has had great delay in plant siting and is now seeking ways to streamline and expedite the process. We've heard from the experts in the EPA that the current siting process addresses the various needs and requirements for these plants, and our recommendation is that anything stricter would be detrimental and would have no further value. Tr.1 at 330-331.

Ms. Greenberg noted that other states use different siting processes and stated:

> [T]here are the state permitting process and a local process, and a smaller number of states have adopted a process for siting and permitting the peaker facility or other generating facilities that's administered in one stop in one place or a combined hearing at the state level. Oftentimes, those proceedings are a carryover from the permitting of utility-owned generation, and in Illinois that's not the case. California is an example of a state that's currently experiencing the consequences of a very bureaucratic and time-consuming process for siting plants. In California, a plant of 50 [MW] or more must be approved by the California Energy Commission. Many proposals there have taken more than a year to get through this process, and California has not been able to add the generation that it needs at a rate which reflects its growth. Tr.1 332-333.

Ms. Greenberg asserted that peaker plants typically only want to site where they are welcomed and once they are there they do not adversely affect the community:

> In conclusion, you need to keep in mind that an emergent plant developer does not typically wish to build and operate a plant where the plant is not going to be accepted by the community. They look for a place that's appropriate, appropriate both in terms of the electric transmission and the gas supply and the community and work with the community to achieve community support and to be a good member of the community. Communities which welcome the peaker plants and other generating plants recognize the benefits and positive impacts of this development on their communities. These might include new jobs, increased tax base, and possible attraction of additional economic development. There's also very little strain on the local resources when these plants are sited. They

> don't use schools, for example. They give a lot to the community and take little. A community that accepts the peaker plant understands that a peaker has these relatively few impacts and that it provides the necessary service to the community and benefits the public welfare by contributing to the electric supply of the community. Tr.1 at 333-334.

Mr. Smith of ISAWWA stated that his organization "believes that peaker plant siting requirements should encourage the siting of these plants near a sanitary water treatment plant, if practical, so as to utilize the discharge from the sanitary water treatment plant known as gray water or cooling water." Tr.1 23-24.

ComEd described the enhanced siting role that local government has in the restructured electric industry:

> Before restructuring, * * * [l]ocal input was limited, because a state Certificate of Public Convenience and Necessity generally preempts local ordinances such as zoning, and regional public utility power plants and transmission lines are considered matters of statewide, not local interest.
>
> In the restructured industry, in which generation is built by private companies based on market factors . . ., the [ICC] does not examine the need for the project. * * * However, the local counties and municipalities now have a significant role to play, using zoning and other land use regulation to direct new plants to suitable locations. ComEd Exh. 1 at 8-9.

ComEd claimed that the current system of siting new peaker plants is "clearly working":

> [U]nlike a state-regulated public utility, a private developer must fit its new plant into the zoning and siting scheme of the neighborhood it chooses. Municipalities are well aware of how to use their zoning power and have substantial discretion to grant or deny zoning changes or variances. For this reason, some plants have obtained approval, while numerous other plants have been turned down. (The latest example: since the first hearings before the Board in this docket, the Board of Trustees of the Village of Libertyville rejected a zoning request for a new peaking plant.) So, the current situation does not demand an overhaul of the siting mechanism. Certainly, a time-consuming, expensive, bureaucratic process would discourage independent power from locating in Illinois. PC 164 at 7.

PG&E stated that a siting process like SB 172 "could have benefits" but "could also pose significant costs and delays that could threaten reliability." PC 170 at 3. PG&E stated that in most states with:

> [C]omprehensive power facility siting processes, the decisions of the state run boards overrule local jurisdictional authority. This is the case in Wisconsin, New York, Massachusetts, Connecticut, California, and Florida, among others. This type of process has cause[d] delays in facilities siting in a number of these states, with delays in California being the most significant. PC 170 at 3.

PG&E stated that siting boards offer power plant developers a "venue in which local concerns can be balanced against other issues. In some cases, siting boards decide to certify a project over the objections of local citizens, deeming a proposed site the best alternative." PG&E added that, "[f]rom the perspective of home political authorities and citizens, . . . such boards have the ability to run roughshod over local preferences." PC 170 at 3.

PG&E made a recommendation:

> A process could be adopted to allow individuals or organizations with standing in a local proceeding to appeal to a state run board for assistance. This could occur if local authorities lack adequate resources to review project proposals, or if citizens or developers feel that a local process has produced an inappropriate result. The board could promulgate siting criteria in advance that would be applied to cases brought before the board. We believe the [Board] would be the appropriate agency in which to locate such authority. PC 170 at 3.

E. Information from Local Government

Mr. Shay, Senior Planner for Will County, stated that "I can tell you how land use goes and that is smaller jurisdictions have the authority—or not the authority, but have a clear and legal involvement in the decision-making of larger jurisdictions, but it does not go the other way." Tr.1 at 727. He continued:

> To create an example for that, a municipality can do as it pleases. When the county hears the petition near that municipality, then the municipality has a direct and active role in decision-making. In fact, municipality or a township can legally challenge certain decisions made by the county—the county and planning zoning commission and Will County Board and force a super majority vote of the County Board to affect a decision. So smaller localities could have a large impact on county-wide decision-making, but it's only one way. Obviously, we would prefer to be—have it both ways, but that's up to the legislatures, I guess. Tr.1 at 727.

Mr. Shay testified:

> We also face the additional problem that we're only in the unincorporated area. So if we regulate these facilities restrictively, they will do what many of them

> have already done and go to municipalities that feel that they have something to gain by the placement of these facilities regardless of what they are and that is why we feel action on part of the state or the federal government is required so that we can't simply hop jurisdictions or play an annexation war or play two municipalities off of each other for a lower level of regulation, which is exactly what is happening in placement of these facilities. Tr.1. at 712.

Mr. Hoss of the DuPage County Department of Development and Environmental Concerns testified:

> DuPage County is non-homerule county and as such is given zoning authority by the state of Illinois to regulate and restrict the location and use of structures, buildings and land pursuant to state statute. The authority from the state allows the county to develop rules and regulations consistent with the powers granted by the state of Illinois that supplement rather than supersede that authority. The zoning authority of DuPage County is limited to the unincorporated areas of DuPage County only. * * * It's important to note that DuPage County has no jurisdiction over the local municipal land use controls and development processes nor can the county intercede in local municipal development processes. There have been issues currently with respect to siting of peaker plants where some neighboring citizens felt that the county had some jurisdiction over municipal processes and we don't. We only have jurisdiction over the unincorporated areas of DuPage county. Tr.1 at 393-394.

Ms. Carter, a member of the Lake County Board, testified that aquifers do not end at municipal or political boundaries. She stated that the water consumed in one village not only limits the supply of its immediate neighbors, but impacts the supply of more distant villages, commercial wells, and deep community wells that draw from the same aquifer. Tr.1 at 796.

A number of local and State officials, including State Representative Cowlishaw, expressed concern that residents and officials in neighboring municipalities and surrounding counties have no voice in a given municipality's zoning approval process for a peaker plant, despite the potential cross-boundary environmental impacts of peaker plants. They also testified that potential cross-jurisdictional environmental impacts from individual or multiple peaker plants, such as from air emissions, noise emissions, and water use, cannot be addressed effectively by local government.

Mayor Lund of Warrenville testified that "all zoning authority is local and that's, of course, one of the reasons Warrenville does not have standing in the consideration of a peaker plant in another community." Tr.1 at 421. Mayor Lund explained why her constituents are concerned:

> Warrenville citizens live just on the other side of the railroad track and just the

> other side of the railroad track is Aurora where a peaker power plant has been sited, and because the prevailing winds blow this way, we are obviously in the path of whatever might from come that direction. Tr.1 at 389.

Mr. LaBelle, Chairman of the Lake County Board, stated that the regulations and the permitting process need to be comprehensive and cohesive. He stated that a single agency must be responsible for planning, licensing, and permitting peaker plants. Tr.1 at 781-782. Mr. LaBelle testified:

> [A]t a previous hearing, EPA director Tom Skinner indicated that IEPA rules and permitting did not supersede local zoning and land use control. However, the Lake County State's Attorney advises us that our options are severely limited in this area. There are 52 incorporated municipalities in Lake County. Each municipality has the authority to create its own zoning regulations and can approve zoning for a power plant without any consideration of the county, other municipalities or regional impacts. While there is a system of local control, there is no provision for impacts that cross boundaries. If any of Lake County's 525 municipalities chooses to allow a peaker plant to be built within their borders or agrees to annex unincorporated land, neither the county nor any other municipality has a voice in the matter. Yet the environmental impacts of peaker plants clearly extend beyond geographic boundaries. Air pollution can extend for miles. The high volume of groundwater usage can lessen the supply for any other entity tapping the same aquifer. Illinois counties and neighboring municipalities have no ability to participate in addressing these externalities. Tr.1 at 783-784.

Ms. Cole of the Lake County Board stated:

> [T]he environmental effects of peaker plants do not recognize political boundaries. The locations for these proposed facilities are oftentimes situated at the border of another local government. In many cases those most affected do not live within the political jurisdiction where the peaker is proposed, and in some cases are not allowed a voice in the proceeding, even though they will be most affected. Tr.1 at 789-790 ; see also Tr.1 at 516, 518 (Zingle), 475-476 (Goff).

Ms. Cole gave an example:

> As you know, the village of Libertyville has held extensive public hearings on the construction of a proposed peaker plant by Indeck Corporation. The site for the proposed facility is approximately 2 miles from this room. That location is at the extreme northwestern edge of Libertyville. If the facility is ultimately approved and constructed, the properties most affected by this facility would be

> properties located in the village of Grayslake or in portions of unincorporated Lake County. * * * During recent proceedings, nonresidents were not provided an opportunity to testify, even though they would be directly impacted by construction of the proposed facility. Tr.1 at 791.

Mayor Lund also noted that "[l]ocal governments have not had adequate time to respond to the zoning implications of peaker plant constructions." Tr.1 at 389. Mr. Hoss, Zoning Manager for the DuPage County Department of Development and Environmental Concerns, testified about the status of peaker plants in the local zoning ordinances:

> One of the main recommendations that we are looking into is better definition in our own zoning ordinances with respect to peaker plants and similar type industry. Currently, we have a definition of a public utility and public utility is currently exempt from local DuPage County zoning ordinances. They enjoy special exemption because they are a public utility. It is our understanding from all the research and the information gleaned from these various areas that the peaker plant industry is not considered a public utility and doesn't require the same exemptions to the county zoning ordinances, therefore, we're looking at straightening out public utilities from private utilities. * * * [A] peaker plant would be considered a private utility per our ordinances. As such, that facility would be required, in terms of siting, to be located in either l-1 or l-2 industrial zoning district in the county and only after approval of a special use by the DuPage County Board. Tr.1 at 397.

Mayor Lund testified that "[r]egional impacts and the accumulated multiple construction effects related to airborne pollution, water supply and disposal, esthetics, noise, property values and even airport safety have not been adequately reviewed and measured." Tr.1 at 389.

Regarding SB 172, Mr. Hoss stated:

> One of the concerns I think that we have of going through the pollution control siting process is that the siting process is very specific to the things that the county looks at, and some of those specific things don't necessarily deal with some of the fundamental zoning things that I was talking about in our zoning ordinance, so in a sense, if we were to go through that pollution control siting process, there might be the possibility that we ultimately might lose some local control at the zoning level. For instance, it's my understanding that once a facility is sited, it is actually taken out of local zoning control and, therefore, issues like noise could not be controlled by local zoning authority, and, therefore, I don't think it would be wise to go through the siting process with these facilities because, as I said, I think we lose local control. Tr.1 at 409.

Mr. Shay discussed the use of land buffers around peaker plants:

> It was intended so that if a peaker facility wanted to ameliorate themselves from the surrounding area because Will County is largely rural, they could actually purchase the land that's surrounding them and that would move any potential residence or conflicts under their umbrella of control. So we gave them the option to purchase that land and basically eliminate the problems presented by the radius. So we were looking for ways to make it so they could actually build a facility, but do it in sort of a responsible way. Tr.1 at 718.

Dr. Winstanley's concerns about water use were echoed by numerous local and State government officials and agency representatives, including State Senator Link, Mr. Kucera, an attorney with Chapman & Cutler appearing on behalf of the Lake County Public Water District, Mr. Shay, Senior Planner for Will County, and Ms. Carter of the Lake County Board. Tr.1 at 709 (Shay), 752 (Link), 765 (Kucera), 793 (Carter). For example, Ms. Carter testified about cross-jurisdictional impacts on water use:

> In the case of the Island Lake [peaker plant] proposal, adjacent villages would have realized significant financial impacts. Nowhere in the permit application process submitted by the applicant were those impacts acknowledged or addressed. One neighboring village, the village of Wauconda, would have incurred expenses close to $1 million to reset the pumping well head in two municipal wells. The taxpayers of this neighboring village, not the power company, would have borne this expense, $1 million. This village had no opportunity to voice its concern during the application review. Surely, this demonstrates why a regional application approach must be in place, must be put into practice. Tr.1 at 796-797.

Mr. Shay testified about what the respective roles of the State and local government should be in approving peaker plants:

> I would reserve for [local government] the site design, the general location, what zoning districts it's allowed in, that sort of thing. I would treat it like a normal land use in the sense of local authority. When you place how far it's going to be from a property line, how far does it have to be from other uses, how should the site look and appear? * * * [A]re construction vehicles from that city road appropriate or safe? Keeping in the standard land use format, but I think the [State should] adopt[] things that we cannot exercise full control over. Right now, most immediately apparent one of those is water use.
>
> * * *

> Pollution and environment issues do not obey jurisdictional boundaries. So I guess I'm asking the state to take additional authority in cross-jurisdictional issues, which is what they have shown a pattern of doing because it's efficient for the community as a whole to do so. Tr.1 at 725-726.

Mr. Shay testified that peaker plant developers search for the local jurisdiction with the least stringent regulations:

> [I]f [Will County] regulate[s] these facilities restrictively [in the unincorporated area], they will do what many of them have already done and go to municipalities that feel that they have something to gain by the placement of these facilities regardless of what they are and that is why we feel action on part of the state or the federal government is required so that we can't simply hop jurisdictions or play an annexation war or play two municipalities off of each other for a lower level of regulation, which is exactly what is happening in placement of these facilities. Tr.1 at 712.

Mr. Shay further testified that Will County is concerned that peaker plants are not being "distributed equitably throughout the [electric power] grid." Tr.1 at 708. He explained:

> We're concerned that Will County has a lower [income] level than any of the surrounding counties and it has a number of communities which have been economically troubled and we're concerned about the equitable locations. We're concerned that we would become a concentration by these facilities over time. Tr.1 at 731.

Mr. Shay stated that an inequitable concentration of peaker plants is a concern because of the additional use of Will County's infrastructure without an adequate tax revenue in return, and because of air and water issues. Tr.1 at 731-732.[21]

X. MORATORIUM

In this part of the Report, the Board summarizes information from the record on imposing a moratorium on peaker plants. The Board summarizes information from citizens first, then information from State government, and lastly information from local government.

A. Information from Citizens

Ms. Toni Larsen is a resident of Zion. She asked for "a statewide moratorium on

[21] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

licensing peaker plants until more research can be done regarding the impact of air pollution, noise pollution, zoning and groundwater supply and then I am asking that you act as a proactive preventive agent in protecting our environment." Tr.1 at 911.

Ms. Voitik of CAPPRA urged the Board to impose a moratorium: "I emphatically request a moratorium on all peaker plant activity with all new plants and plants with pending permits not to be grandfathered in." Tr.1 at 487; see also Tr.1 at 493 (Gravenhorst), 522, 525 (Zingle), 572 (Goff), 646 (Stark), 921 (Geiselhart), 935 (Snider), 945 (Owen); Tr.2 at 185 (Zingle).

Ms. Zingle argued that there is precedent for a moratorium:

> McHenry has a moratorium against the peakers. Waukegan just did a moratorium against the peakers. Lake County when we were doing our unified development ordinance this spring stopped all building permits and nobody sued us. Everybody understood we need to rework the system. The process is starting to catch up to the power companies too. Not only did Libertyville opponents spend money and time, so did Indeck, only to be turned down. And since Indeck's proposal was denied, they're now claiming that they were held to an unbearable standard. There's a headline, I left it over in the other book, the power company is stunned by Waukegan's decision to do a moratorium. The power companies are going to be looking for relief soon too as the fights escalate. Tr.1 at 523; see also Tr.1 at 532 (Zingle).

In response to a question about the Board's authority to impose a moratorium, Ms. Zingle stated: "We haven't found anything that says [the Board] can't." Tr.1 at 531.

Ms. DeJovine of Bartlett CARE stated: "We ask—I especially ask for a moratorium on these until everybody could come up on that learning curve and learn the right questions to ask and not drain the resources of our community." Tr.1 at 544.

Mr. Nesvig, a resident of Evanston, stated that he "would like to see a moratorium on issuing permits and construction of peaker power plants until [IEPA] and the [Board] can initiate regulations that determine what electric power generating capacity is actually needed in Illinois for its citizens and commerce as a whole and take suitable action . . . ." Tr.1 at 703.

Mr. Silva of NRDC suggested that a more-inclusive siting process would be more appropriate than a moratorium:

> [I]t's kind of football we have going on between, you know, the regulative and state agencies over whether or not they can stop this, whether or not they have the authority to make—issue a moratorium or not. I think it would be more useful actually seeing where you can actually collaborate and add some

> certainty, because the other thing is that many of these projects that you're looking at are worthwhile and will add a significant reliability to the system. Tr. 2 at 104.

B. Information from State Government

Director Skinner testified that IEPA cannot impose a moratorium:

> [T]here have been calls from various folks for [IEPA] and/or the Governor to impose a moratorium on issuance of peaker permits. We've looked at that issue extensively and concluded that we don't have the authority to do that. By operation of law, these permits issue after 180 days. So, we've had it suggested to us, well, just don't act on it. That doesn't do any good. I mean, if we don't act on it, the permit is granted. That actually is counterproductive compared to what we want to do. So we're forced to proceed. Similarly, the Governor has concluded that he doesn't have the legal authority to impose a moratorium by executive order. It literally requires legislative action. Tr.1 at 196.

An IEPA exhibit similarly stated that IEPA "does not have the legal authority to impose a moratorium on the issuance of permits to peaker plants. * * * [IEPA] is required to process the permit application for a new plant within 180 days." IEPA Grp. Exh. 2, No. 20 at 2.

State Senator Link testified:

> As many of you know, earlier this summer, I led a bipartisan group of suburban legislators in calling for a moratorium on permitting of peaker power plants. We made this call after receiving numerous questions from environmental groups, local residents and numerous elected officials. There remain too many unanswered questions regarding these peaker use power generators, and I believe that the public deserves to receive better information before we issue any additional permits. Tr.1 at 752; see also Tr.1 at 756 (Garrett), 757 (Ball on behalf of Gash).

State Representative Cowlishaw urged the Board to impose a moratorium: "I would urge you, the members of the . . . Board, to consider the possibility of imposing a moratorium on construction of peaker power plants until legislative action can be taken during the spring session of the year 2001." Tr.1 at 387.

C. Information from Local Government

Mayor Vivien Lund proposed a moratorium: "In order to protect the state of Illinois, a moratorium should be established to prevent further construction or approval for construction until these items are appropriately addressed. Newly constructed facilities should not be

grandfathered." Tr.1 at 390.

Mr. LaBelle of the Lake County Board stated: "We feel that a moratorium on permits is necessary in order to allow the state to responsibly plan for the oversight of these facilities and form comprehensive cohesive guidelines to the licensing of these operations." Tr.1 at 785; see also Tr.1 at 786 (Cole).

Ms. Carter, a member of the Lake County Board, testified: "Place a moratorium on all pending and new applications for power or peaker plants until such time as all agencies have collaboratively worked together reducing and/or eliminating the negative impact to our quality of life." Tr.1 at 801.[22]

XI. HEALTH AND SAFETY

In this part of the Report, the Board summarizes record information on health and safety concerns over peaker plants. First, the Board summarizes information on health and safety concerns generally. The Board then summarizes information concerns that peaker plants have raised regarding aviation, vibrations, and decommissioning.

A. Health and Safety Concerns Generally

1. Concerns of Citizens

Citizens expressed concern about numerous aspects of the safety of peaker plants. These concerns ranged from the safety of the physical structure, to potential for chemical explosion, to general health concerns.

Mr. Goff, a resident of Warrenville, expressed concern regarding the structural safety of peaker plants: "if you go into a situation where you're going to build a high-rise and you're up against the same analogy that you might be looking on city government to—there might be a new fire code reg or something like this and let's build this building as quick as we can before they find out about it or before they, quote, 'put the rules to ink,' is that a safe building? Does this make common sense? I mean I wouldn't want to walk into it." Tr.1 at 472.

Ms. Zingle expressed concern regarding the potential for an accident at a peaker plant: "I've been doing this with some intensity for close to a year now and I just found out that the turbines and the glazer are encased in hydrogen. I don't know what that means. Do they have hydrogen tanks on the property? Do we need to be worried about explosion? The companies

[22] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.

will deny that they have wastewater." Tr.1 at 529; see also Tr.1 at 647 (Stark), 543 (DeJovine), 561-562 (Goebel).

Ms. Cathy Capezio expressed a more general concern about safety: "IEPA came back to us and said that they cannot guarantee that these are safe. They don't know if they're safe. That is written in their response to the public. I urge you, you need to prove that it is safe." Tr.1 at 480; see also Tr.1 at 482 (Capezio). Ms. Voitik added: "build the plants in safer areas away from ozone and environmentally sensitive areas. This includes residential areas where the health of citizens is at risk." Tr.1 at 503; see also Tr.1 at 493 (Gravenhorst), 647 (Stark), 984 (Jacobs), 524. (Zingle); CAPPRA Exh.1 at 2.

Ms. Geiselhart of CCLC stated:

> New research on environmental particulates provide—and I am quoting here, on the environmental and health impact of particulates that were sufficiently compelling that the federal EPA has proposed regulations in 2.5 that reduce the allowed levels of particulate emissions and apply these limits to substantially smaller particulants and that are covered by [PM 10] and right here I am quoting from a paper that was written by Richard Domanik, Ph.D. He has his Ph.D. in chemistry. He has extensively researched recent studies regarding environmental particulates, and I will turn over to you his letter, which was presented at an IEPA hearing in April of 2000. And it documents well research on both health and environmental effects. I am not sure that it has been shared with you prior to this time. And in his document he talks about the effects of creating acid rain. He talks about health effects. He talks about meteorological and climatological effects among other things. Many residents of nearby communities and users of ports facility must suffer the effects of increased pollution in the form of more asthma attacks, decreased lung function and other serious impairments since peaker plants tend to operate, again, as I said, during these periods of peak summer demand. Tr.1 at 913-915.

Mr. Wilson testified about "charged particles":

> There is a physicist over in England at Bristol University who has been working on a theory about electromotive force, electromagnetic radiation and the harm it is causing the people and causing cancer. And no one has been able to put a handle on this and what maybe is the cause of this particular problem. Well, what they are coming up with—and they are coming up with some pretty good proof—is that in areas where you have high pollution, and as high pollution passes through the power lines, the particles become charged, and those charged particles remain charged for up to five miles away from those lines. That means if you have people living in that area they will be breathing that atmosphere of the charged particles. And what they are stating is that those particles will stick

> in your lungs at a rate 100 times greater than it normally would if they were not charged. Now, a simple [experiment] that a person can do to get an idea of what is happening around the power lines is this. If you take a four-foot long fluorescent bulb and you just hold it in your hands and you walk underneath a power line at nighttime, it will light up. Now, you can be 50 feet from that line, but that fluorescent bulb lights up. Does that tell you that there is an energy field around those lines? So now take that energy field and those distribution lines and add in a power plant throwing out hundreds of tons of pollutants going right past those lines, and what happens to the people that are living right around that area? It is not a good situation. And to give—to give proof of this is that the National Institute of Environmental Health Sciences, the federal government, a medical body did research in this area also. And in 1998 they issued a statement, and they said that they believe that these lines are carcinogenic. And they said prudent avoidance of these lines is what should be done. Tr.1 at 975-976.

Mr. Urbaszewski of ALAMC and IEC testified about PM:

> Fine [PM] is composed of a number of tiny particles, both solid and liquid aerosol, that have diameter of less than two and a half microns. Inhalation of fine particles are associated with the following health impacts: Upper and lower respiratory infections, asthma attacks, development of chronic bronchitis and, most importantly, premature deaths. Due to these public health threats, USEPA established a fine particulate standard in 1997 based on the available medical evidence at that time. New studies done in subsequent years have validated the health impacts established in prior studies. Tr.1 at 112-113.

He added:

> Inhalation of fine particles are associated with the following health impacts: Upper and lower respiratory infections, asthma attacks, development of chronic bronchitis and, most importantly, premature deaths. Due to these public health threats, USEPA established a fine particulate standard in 1997 based on the available medical evidence at that time. New studies done in subsequent years have validated the health impacts established in prior studies. Tr.1 at 127.

2. Information from State Government

Director Skinner stated that "[i]t is [IEPA's] job to insure that there is a safe environment and that the state's citizens are being protected . . . ." Tr.1 at 176. Director Skinner testified that IEPA is "in the process of regularly reevaluating the standards that exist out there right now in order to make sure that we're adequately protecting human health and the environment and maintaining consistency with the national air quality standards." Tr.1 at 54. He concluded:

"Now, after a thorough analysis of computer runs and continuing that analysis and modeling, we do not believe the plants that have been proposed to date and permitted represent significant health or environmental threat." Tr.1 at 58. An IEPA "fact sheet" similarly noted that "the evaluations of new peaker power plants for which [IEPA] has received permit applications to date have indicated that the plants will not have a measurable impact on air quality. * * * [I]f a source does not have a measurable impact on air quality, there should not be a health impact." IEPA Grp. Exh. 1, No. 20 at 1.

Director Skinner stated, however, that:

> [A]s we gain additional experience with peakers, we will regularly re-evaluate whether the air requirements provide protection of health and environment, and be—are consistent with national air quality standards. If and when we find the existing requirements are lacking, we either administratively address the problem, if we have the legal authority to do so, or we will propose appropriate regulatory changes to the Board or legislative changes to the Illinois General Assembly. Tr.1 at 58.

State Senator Chris Lauzen asserted that "[w]e certainly are not against the power generation. We just want to be sure that as we generate this power that it is safe." Tr.1 at 383. He testified: "I think that our appeal is simple. If this is safe, prove it, but if it's not safe, then stop it." Tr.1 at 382. He continued:

> If it's not dangerous, if these plants are not dangerous, then I think that the folks who are responsible for making these decisions need to reconcile a couple of actions that all of us have read in the Naperville Sun, our local newspaper here, where it says that EPA officials do not believe plants represent a significant health or environmental threat; however, three paragraphs later it says that the director said in July that the EPA proposed to rule to reduce statewide [NO_x] from electrical generating facilities including peakers and the . . . Board is working on a rule which is expected to be completed at the end of the year. If there is no problem, then there would be no action it would seem to many of us who are watching as these decisions are being made on our behalf. Tr.1 at 382-283.

3. Information from Industry

According to Ms. Greenberg of MWIPS, "there's a strict set of regulations applicable to these plants, and the peakers do not pose a threat to air quality, to human health, or to the environment." Tr.1 at 327.

4. Information from Local Government

Mayor George Pradel of Naperville stated that "[w]e believe, as all of you do, that new generation should be environmentally sound and safely located." Tr.1 at 380.

B. Aviation Concerns

1. Concerns of Citizens

A number citizens raised concerns regarding flight safety in the vicinity of peaker plants. They were concerned about potential air turbulence for aircraft caused by peaker plant stacks emitting pollutants at very high velocities. Tr.1 at 447, 473, 964, 968. Mr. Goff, a commercial pilot residing in Warrenville, expressed concern about a peaker plant proposed to be built less than five miles from the DuPage County airport. He asserted that flying through high velocity emissions is not safe. Tr.1 at 474. Mr. Goff noted that the Federal Aviation Administration (FAA) requires any hazardous obstacles over 100 feet tall, such as buildings and towers, to be identified on flight maps. He urged the Board to ensure that peaker plants are also identified on flight charts to warn pilots flying in the vicinity of these plants. Tr.1 at 474.

Mr. Goff stated: "when you fly through a jet blast, there is substantial aerodynamic changes on the aircraft which you're going through this stuff and when you're flying through this kind of a velocity . . . . I don't think this is being looked at whatsoever." Tr.1 at 472-475 (Goff); see also Tr.1 at 486 (Voitik), 447-448 (Turnball), 518 (Zingle), 541 (DeJovine), 963 (Matijevich), 968-969 (Wilson).

Mr. Wilson stated that peaker plant stacks that emit gases at temperatures ranging from 1,000° F to 1,100° F, at a rate of couple of million cubic feet per minute, and velocity of 75 mile per hour, can be a very serious hazard for aircraft if the plant is located near a airport. Tr.1 at 968.

Mr. Silva of NRDC stated: "I've never heard of any aircraft actually suffering any harm from the flue gas exposure. * * * [T]hey actually do experience hitting and other downwash effects, but that's fairly unusual meteorology and not something that we've ever seen as a common or more difficult problem." Tr.2 at 79-80

2. Information from Industry

Mr. Jirik of CPI noted that "pilots using Midway Airport have been flying over our 250-foot tall boiler stacks for over 50 years and we have not heard of any difficulties and we have not heard of any complaints." Tr.1 at 635.

3. Information from Local Government

Mayor Lund of Warrenville stated that airport safety has not been adequately reviewed

or measured. Tr.1 at 390. Mr. Hoss, Zoning Manager for the DuPage County Department of Development and Environmental Concerns, testified that "[t]he county is not pursuing any additional studies with respect to the county airport at this time." Tr.1 at 412.

The DuPage County Board submitted an exhibit that addressed aviation concerns. According to the Versar report: "Concerns have been raised by the DuPage County Airport Authority, the Aircraft Owners and Pilots Association and others regarding the possible affect of peaker plant exhaust plumes on aircraft safety in the vicinity of airports." These concerns included "turbulence caused by large volumes of hot exhaust gasses that intercept landing or take off patterns," and "fogging, icing or visibility problems due to high water vapor content in peaker plant plumes." DuPage County Board Exh. 1 at 23.

4. Information from State Government

Mr. Roger Finnell is an engineer with the Division of Aeronautics, Bureau of Airport Engineering, Illinois Department of Transportation (IDOT). He stated:

> There are several issues associated with electrical generating facilities that have the potential for creating an aeronautical safety hazard. The main aviation concerns associated with peaker plant developments are as follows: Physical height of the structure—including construction equipment—penetrating critical airspace; emission of visible discharge obscuring pilot and/or controller vision within the airport environment; electromagnetic interference with aeronautical, navigational and communication radio signals; and finally, the exhaust plume's vertical velocity and its effect on aircraft structural integrity and aircraft controllability. The first three issues have been addressed by the department in our Airport Hazard Zoning Rules. Presently there are 56 airports which have airport hazard zoning enacted and enforced by the department. These rules effectively limit the height of structures around individual airports as well as address smoke emissions and electromagnetic interference. They can be adopted by the department for publicly-owned airports, but only at the request of the airport sponsor. Alternatives, publicly-owned airports may adopt their own hazard zoning rules that apply to hazards partially or totally within the public owner's territorial limits. IDOT has not been granted authority under Illinois statutes to enact airport hazard zoning for privately-owned open-to-the-public facilities. The only protection these airports have from structures encroaching on their airspace is local land use control. To date, we have not had a peaker plant proposal violate any airport hazard zoning surface nor create an adverse electromagnetic or visible plume concern. However, this does not preclude conflicts with future proposals. A concern to our office is the impact the vertical velocity of the plume has on flight safety. The majority of these plants are a gas turbine-fired—I'm sorry—gas turbine facilities which have relatively high exhaust velocities and temperatures. While the exit velocity of

> the plume dissipates rapidly upon leaving the stack, the buoyancy of the plume due to its heat still causes a significant vertical velocity several hundred feet above the point of discharge. The situation where this is an aeronautical issue is if the plant is within the traffic pattern to the airport. While pattern size is dependent on the speed and number of aircraft within the traffic pattern, the lateral dimensions of the pattern are usually within a mile of the airport. If a generating facility is within this area, it can result in arriving or departing aircraft passing only a few hundred feet over the smokestack of the facility. We have entered into discussions with [the FAA] and manufacturers of general aviation aircraft to find out what the effect of flight into an exhaust plume would have on aviation. To receive certification from the FAA, an airframe must be capable of withstanding a vertical gust of 30 feet per second. However, an aircraft in a landing or takeoff configuration at typical approach and departure speeds will likely lose lift and experience a momentary stall if subjected to a vertical gust of 15 feet per second or more. This is certainly an aviation safety concern. We would like to emphasize that this concern is only for generating facilities within the immediate airport environment. Once away from the airport, aircraft are bound by FAA regulations to be at least 500 feet above the highest obstacle within a horizontal distance of 2,000 feet over sparsely populated areas and 1,000 feet above the highest obstacle within a horizontal distance of 2,000 feet over congested areas. Aircraft operating outside the traffic pattern are also at higher operating speeds and therefore are not as prone to stalling should they encounter larger vertical gusts of more than 15 feet per second. IDOT is currently reviewing our rules and regulations to determine if further action is necessary to prevent discharges from interfering with air navigation and compromising aviation safety. During this time, we request that the . . . Board forward to IDOT any notification it receives of a generating facility being proposed within two miles of a public-use airport for further evaluation. This will afford us an opportunity to work with the proponent to mitigate any impact to aviation. Tr.2 at 15-18.

C. Vibration Concerns

1. Concerns of Citizens

Ms. Schmidt expressed concern that permits are being issued to peaker plants without assurance that "ground vibrations" from the plants are not jeopardizing the safety of the environment and its inhabitants. Tr.1 at 465. Ms. Schmidt continued:

> With numerous plants in close proximity to each other and to residential neighborhoods, this, too, poses a realistic concern. The previous concerns speak to air quality, but these same concerns can be raised for groundwater use, water treatment and release, vibrations near sensitive high tech areas such as Fermi

> Lab, which we are blessed to have in DuPage County and noise pollution. Tr.1 at 466.

2. Information from State Government

Mr. Zak discussed vibrations:

> [L]et's just say that we had some infrasonic sound that is associated with a peaker, and just throwing this out as a possibility, not that we've ever had this problem yet, but in infrasonics, what they will do is it will appear as vibration to most people and people will think that their house is vibrating, the ground is a vibrating and in effect, what it is is an air wave that is being generated by the [plant]. Tr.1 at 199.

3. Information from Local Government

The DuPage County Board's Versar report stated: " In order to protect the operational integrity of the turbines, an operator must maintain operations with very low levels of vibration." The report continued: "A vibration in a gas turbine would need to be corrected long before it reached the level where it was perceptible off-site." DuPage County Board Exh. 1 at 22.

D. Decommissioning Concerns

Mr. John Matijevich stated: "What are we going to do about when these plants and when somebody said they quit making money when they want to decommission?" Tr.1 at 967. Ms. Dorge of LCCA testified: "They are not adequate if we do not really know who is going to own and operate a facility and who will assure that it's properly decommissioned." Tr.2 at 140.

Mr. Kucera, on behalf of the Lake County Public Water District, testified:

> There is no apparent mechanism or regulatory oversight for the decommissioning of these plants, either prematurely or at the end of their service lives. This fact implies that the environmental burdens may arise from abandoned plants for which financial resources may not exist. For example, if a plant is terminated, who will be responsible for resulting excess capacity in the local public water supply? Who will be responsible for capping the plant's wells? Who will be responsible if leakage from the plant has contaminated the source of supply for the local water utility or for individual residential wells? Where is the accountability when these plants are closed down? It would seem appropriate to enact a decommissioning procedure to protect water sources and the public when these plants are removed from service. At the very least, there

should be a procedure for a state administered trust account, which peaker plants would be required to fund, to assure remediation and restoration funds will be available if plant owners abandon plants without protecting water resources. Another possibility is a requirement that a surety bond or letter of credit be posted to secure the obligation to protect water sources. Tr.1 at 767-768.[23]

[23] For additional summaries of public comments, organized with a topical index, please refer to Appendix K. Please refer to Appendix J for a comprehensive table on other states' laws and regulations that may affect peaker plants.